TECHNICAL DOCUMENTATION

Preliminary Schematics

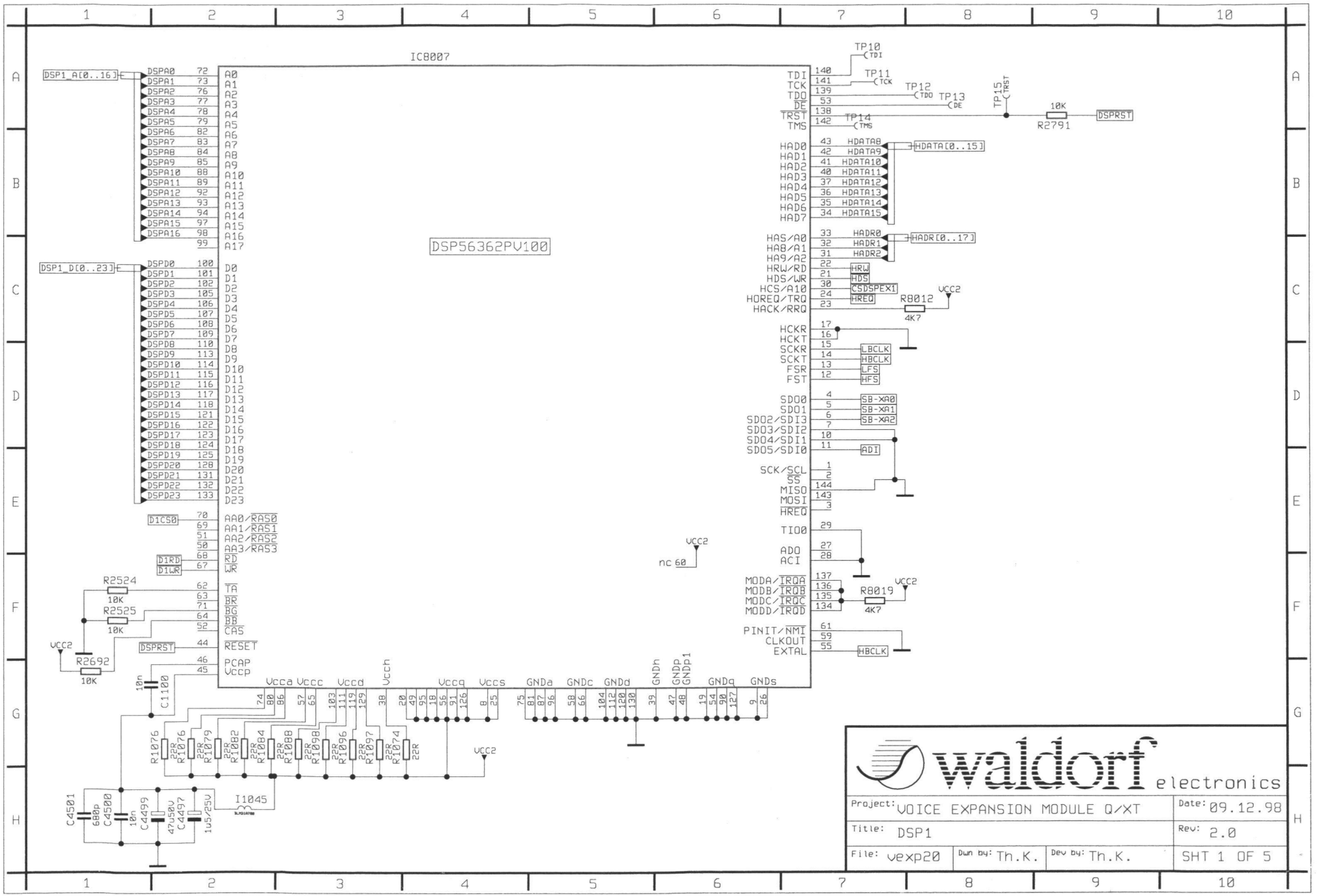
PROJECT: Q Keyboard / Rack

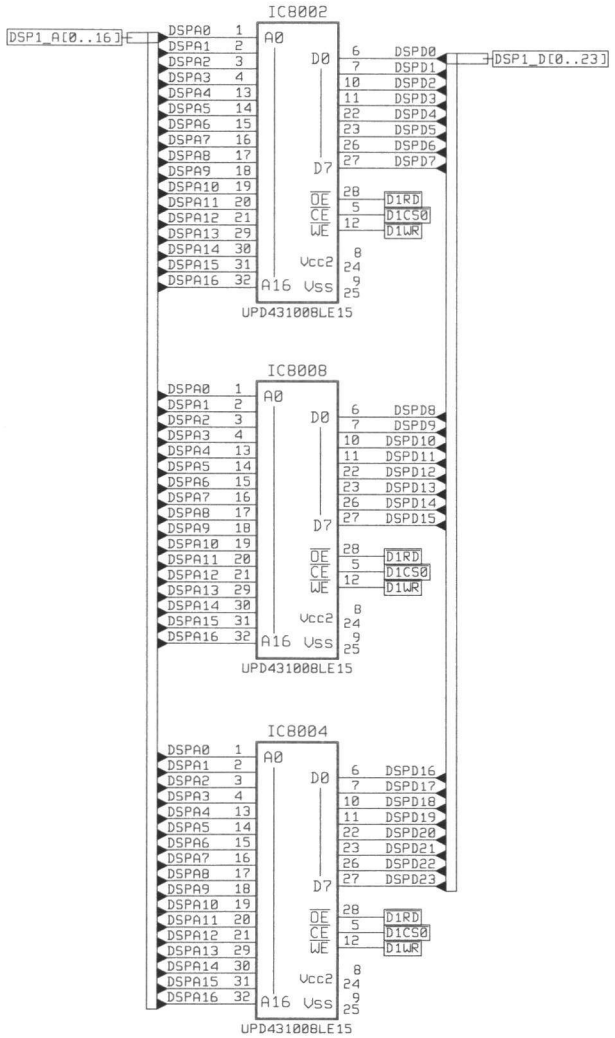
PART : VOICE EXPANSION PCB (VEXP20)
REV : 2.0
DATE : 09.12.99

Document-Name: PD_VEXP20.PDF

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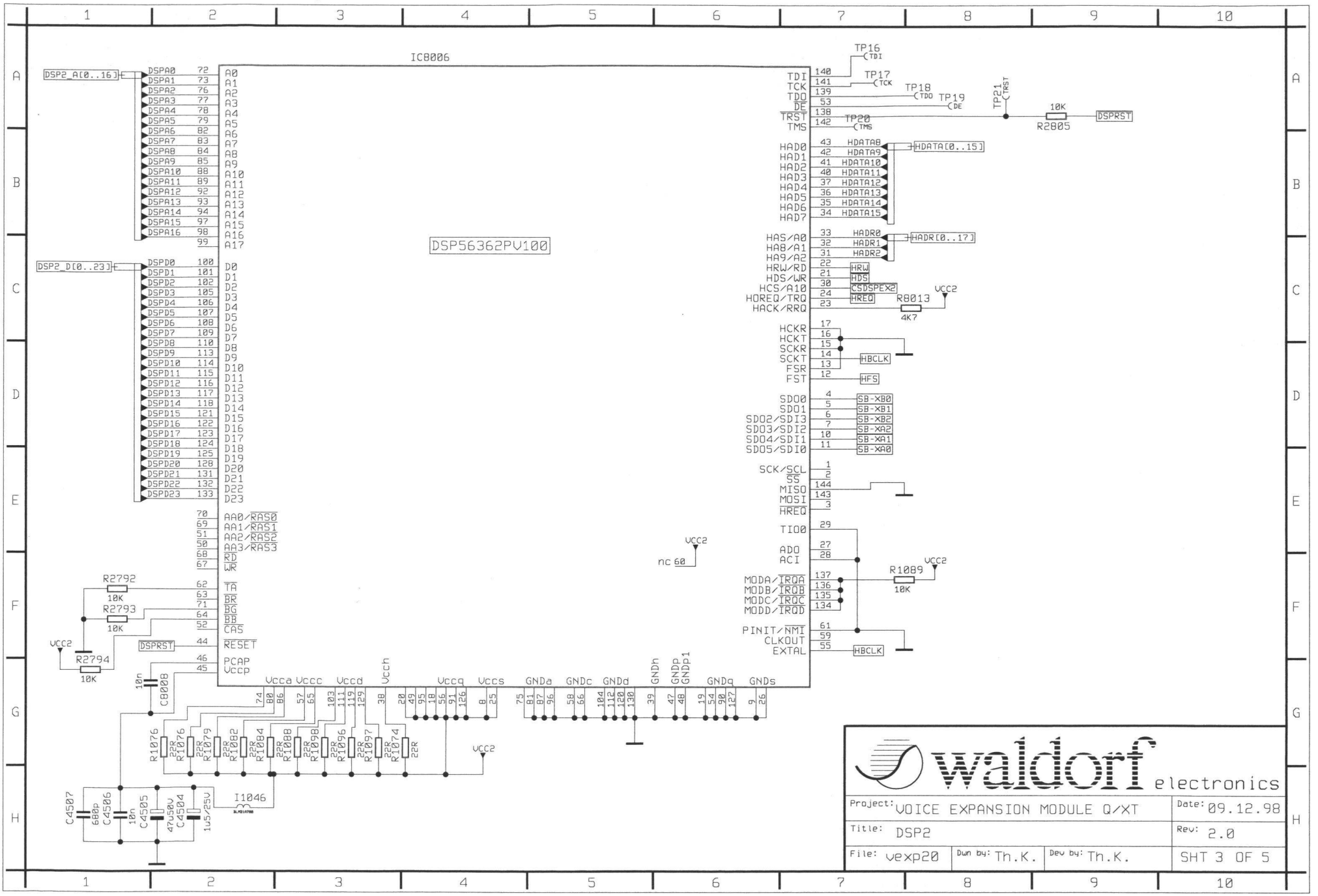
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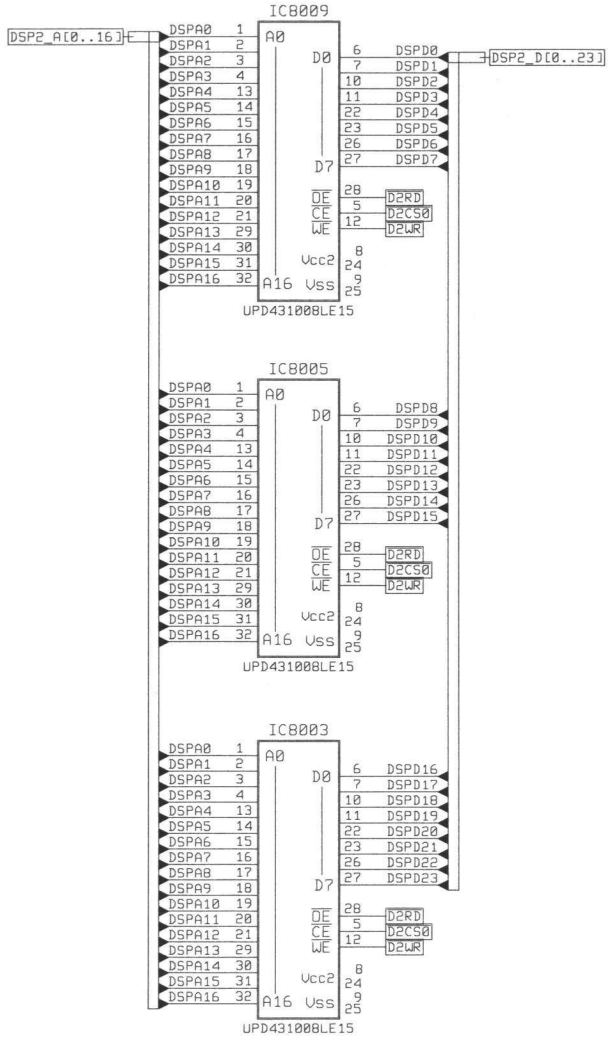

IC8007
DSP56362PV100
DSP1_A[0..16]
DSP1_D[0..23]
HDATA[0..15]
HADR[0..17]
TP10 TDI
TP11 TCK
TP12 TDO
TP13 DE
TP14 TMS
TP15 TRST
R2791 10K
DSPRST
R8012 4K7
R8019 4K7
R2524 10K
R2525 10K
R2692 10K
VCC2
nc 60
C1100 10n
C4501 680p
C4500 10n
C4499 47u50V
C4497 1u5/25V
I1045
R1076 22R
R1074 22R
LBCLK
HBCLK
LFS
HFS
SB-XA0
SB-XA1
SB-XA2
ADI
HREQ
CSDSPEX1
waldorf electronics
Project: VOICE EXPANSION MODULE Q/XT
Date: 09.12.98
Title: DSP1
Rev: 2.0
File: vexp20
Dwn by: Th.K.
Dev by: Th.K.
SHT 1 OF 5



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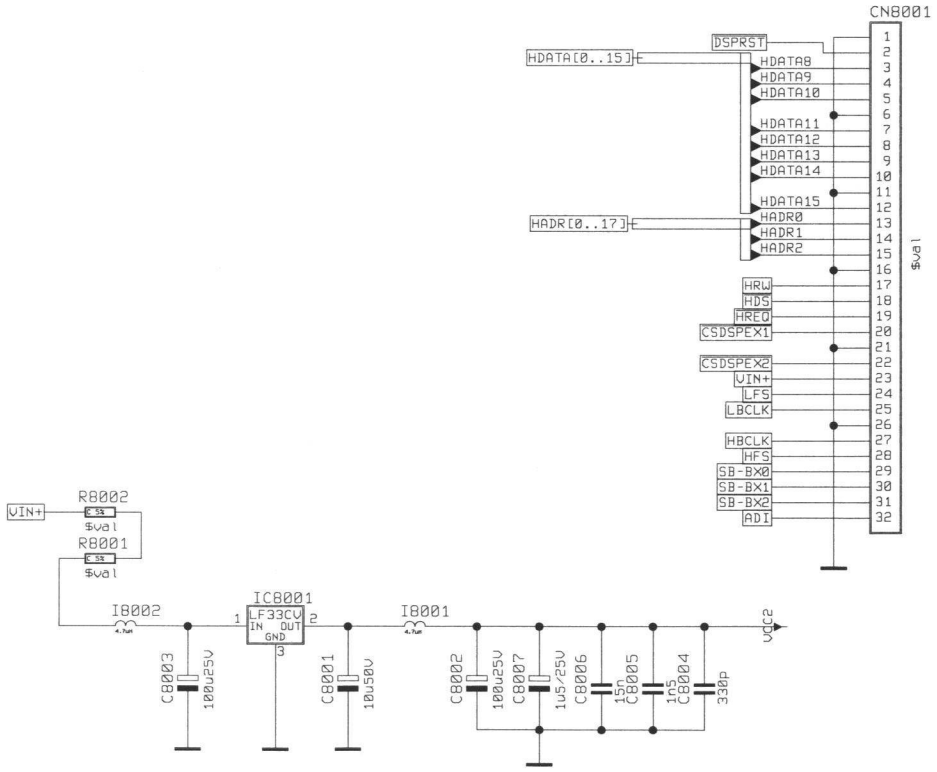
Project: VOICE EXPANSION MODULE Q/XT			Date: 09.12.98
Title: DSP1 RAM			Rev: 2.0
File: vexp20	Dwn by: Th.K.	Dev by: Th.K.	SHT 2 OF 5


ICB006
DSP56362PV100
DSP2_A[0..16]
DSP2_D[0..23]
TP16 TDI
TP17 TCK
TP18 TDO
TP19 DE
TP20 TMS
TP21 TRST
R2805 10K
DSPRST
HDATA[0..15]
HADR[0..17]
HRW
HDS
CSDSPEX2
HREQ
R8013 4K7
VCC2
HBCLK
HFS
SB-XB0
SB-XB1
SB-XB2
SB-XA2
SB-XA1
SB-XA0
R1089 10K
R2792 10K
R2793 10K
R2794 10K
C0008 10n
I1046
C4507 680p
C4506
C4505 10n
C4504 47u/50V
105/25V
R1076 22R
R1079 22R
R1082 22R
R1084 22R
R1088 22R
R1098 22R
R1096 22R
R1097 22R
R1074 22R
waldorf electronics
Project: VOICE EXPANSION MODULE Q/XT
Date: 09.12.98
Title: DSP2
Rev: 2.0
File: vexp20
Dwn by: Th.K.
Dev by: Th.K.
SHT 3 OF 5



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Project: VOICE EXPANSION MODULE Q/XT			Date: 09.12.98
Title: DSP2 RAM			Rev: 2.0
File: vexp20	Dwn by: Th.K.	Dev by: Th.K.	SHT 4 OF 5



M100

Kühlkörper

FK225/SA-L1

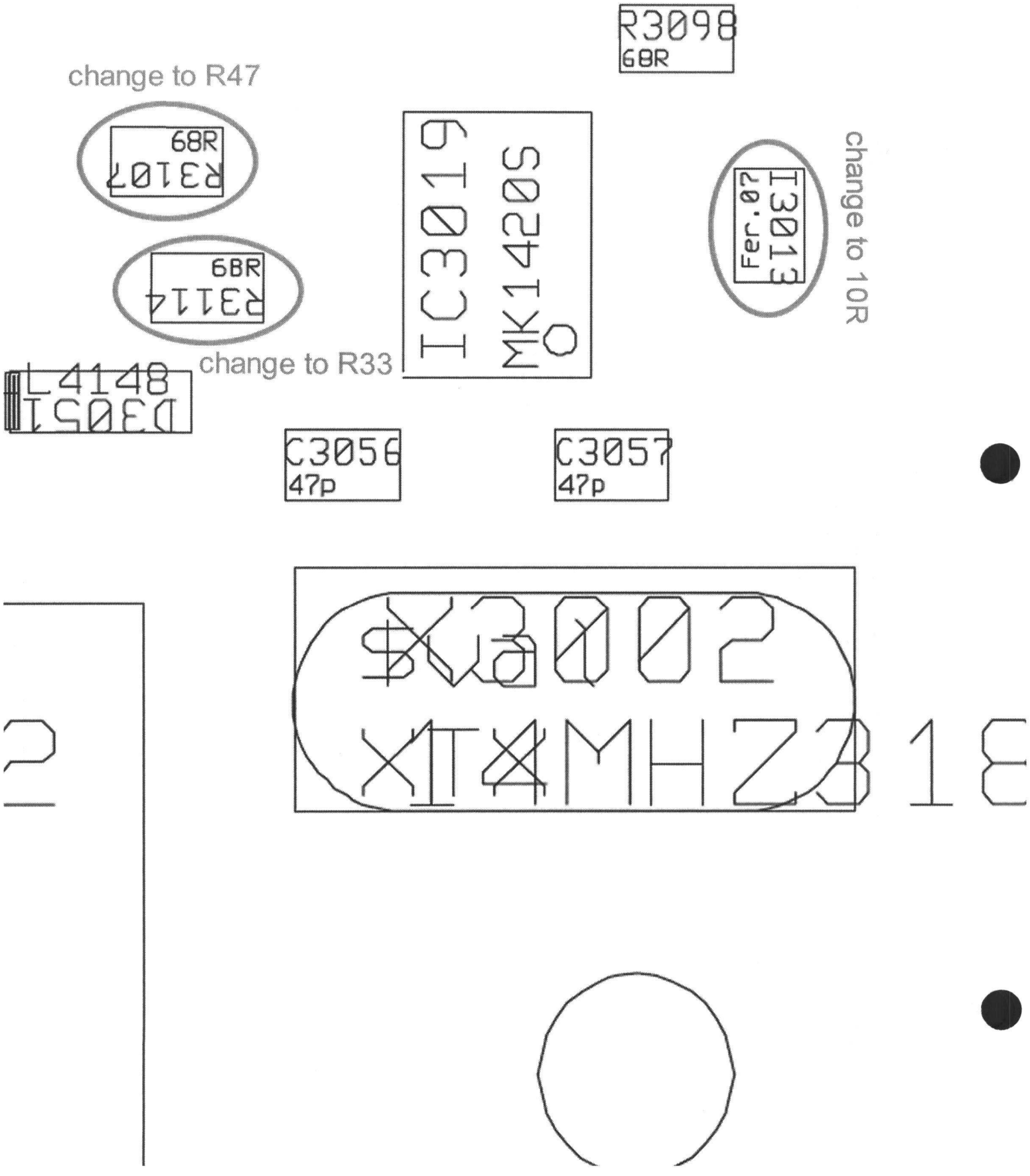
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Project: VOICE EXPANSION MODULE Q/XT			Date: 09.12.98
Title: SUPPLY & CONNECTOR			Rev: 2.0
File: vexp20	Drwn by: Th.K.	Dev by: Th.K.	SHT 5 OF 5

during power up, hold:

Global + Inst.1 = Factory test
Global + Inst.2 = -
Global + Inst.3 = Clear Flash File System Global + Inst.4 = Clear serial data (only with 'B' versions)
Global + Shift = wait for system dump
Global + Play = memory game

Global = Service mode
Multi = Service mode + DSP clock default


R3098
68R
change to R47
68R
R3107
IC3019
MK1420S
O
I3013
Fer.07
change to 10R
68R
R3114
change to R33
L4148
D3051
C3056
47p
C3057
47p
$X3002
XTAL4MHZ
2
1

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TECHNICAL INFORMATION OF CHANGE

PROJECT: MICRO-Q MAIN PCB (MQMB11 + 12)

TIOC #: 18 / 020103

ATTACH TO DOCU: D_MQMB12 / D_MQMB11
PCB REV: 1.1 & 1.2
COMPONENT LAYOUT: 1.1 & 1.2

CHANGED BY: Th. Kircher

SUBJECT: Voice Expansion Installation Procedure
No. of Pages: 2

Requirements:

Voice Expansion Kit, including:
- Voice Expansion Module Rev2.2
- 6 Screws M3
- 3 Distance Bolts
- 3 Resistors 0805 (10R,33R,47R)
- 1 Crystal
- 1 male header 32 pins

ESD Precaution(!)
SMT soldering station, solder, screwdriver
New OS, 2.17 or higher

Voice Expansion Installation Procedure:

1) update the unit with the new OS
2) disconnect power and disassemble unit's housing
3) disconnect display and back panel
4) dismantle the knobs on the front and remove the main pcb
4) modify the main pcb:

following parts are subject to change:

Part Name	*Old Value*	New Value	Schematic Page
R3107	*68R*	47R	5 / C7
R3114	*68R*	33R	5 / C7
I3013	*Inductor replaced by Resistor*	10R	5 / C5

- remove crystal X3002 and solder the new short case crystal on the component side of the pcb
- remove cap C3080 and solder the same type with the leads bended and case laying on the pcb.
- Solder the 32 pin male header CN3006 from solder side
- Fasten the distance bolts also from solder side

5) remount the pcb into the housing, take care for leds and buttons
6) fasten all screws on the main pcb
7) then install the Voice Expansion Module, take care that the male and female header will fit properly
8) fasten the 3 screws at the exp. Module.
9) connect display and back panel
10) connect power and turn the unit into factory test by pressing the buttons "Global" and "Instrument1" during power up
11) select "DSP TEST" with the dial and press "Play". Check that all DSPs and RAMs are o.k.
12) perform the "Button Test" to assure that all buttons act the right way.
13) close the housing and enjoy!

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TECHNICAL INFORMATION OF CHANGE

PROJECT: Micro-Q

TIOC #: 15 / 001120

ATTACH TO DOCU: D_MQBP11 (BACK PANEL PCB) REV1.1 (12.07.00)
PCB REV: REV1.1
COMPONENT LAYOUT: REV1.1

CHANGED BY: Th. Kircher
SUBJECT: Ellimination of hum on phones output
No. of Pages: 1

Description:

Audible hum on the phones output is caused by a high ripple on the power supply voltage. There are 2 ways to solve this problem:

A) Replacing the external power supply (Ouput:12V=, 1.2A. Output voltage ripple less or equal than 100mVpp. Normaly every wall mount switch mode power supply will comply with these specification)

B) Modifying the Pack Panel PCB:

Changed Values:

Part Name	*Old Value*	New Value	Schematic Page
C2034	*470u*	10u/50V	3 / B4

Omitted Parts:

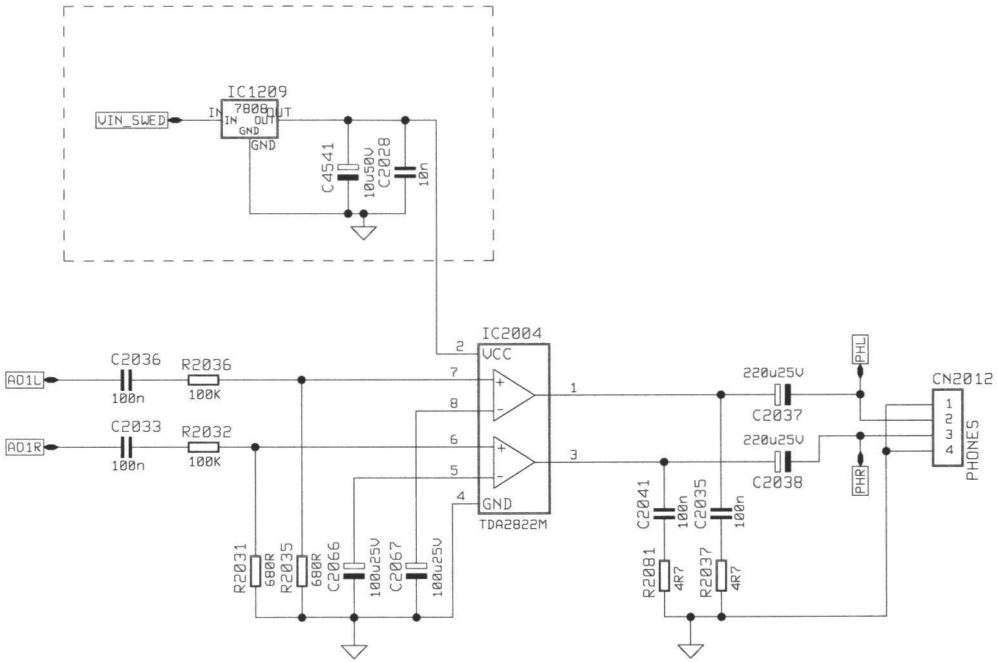
Part	Value	Description	Schematic Page
R2022	*10R*		3 / B4

New Parts:

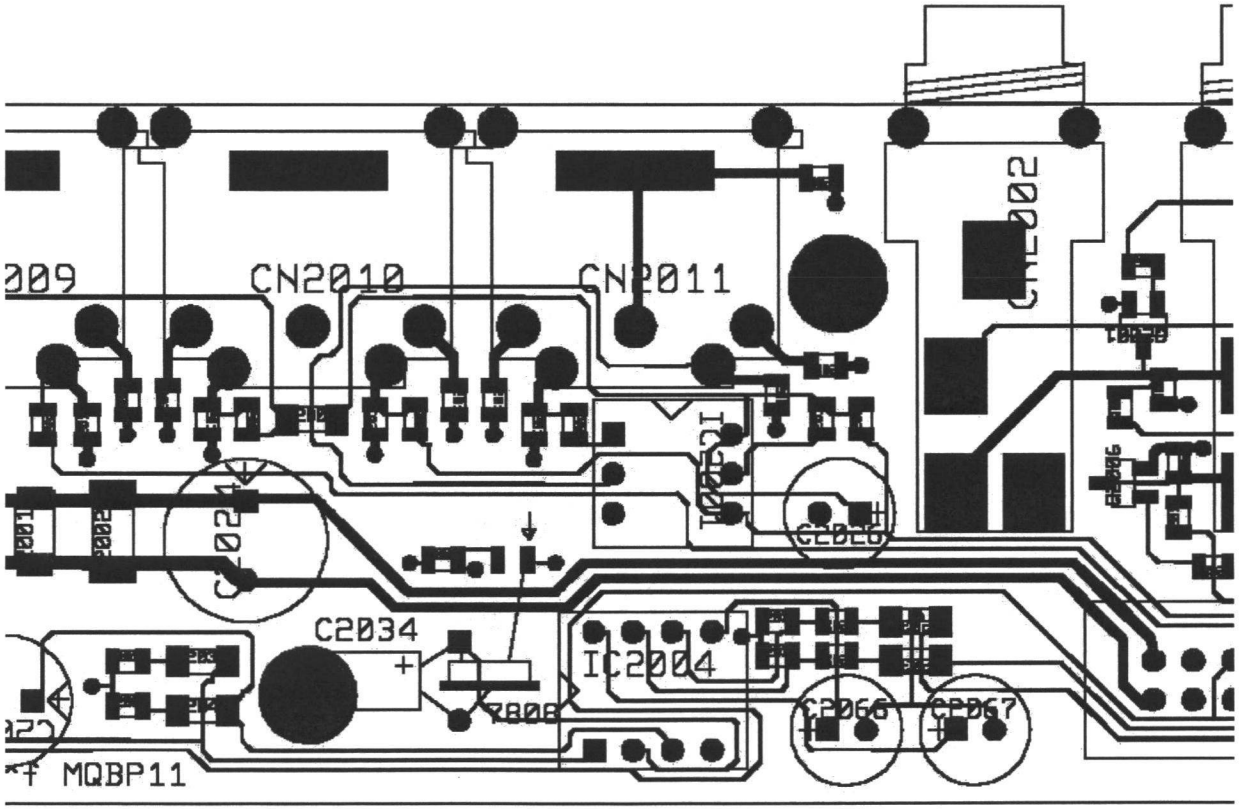
Part	Value	Description	Schematic Page
IC1209	*7808*	Regulator TO220	3 / B4

Modify-Procedure:

Replace the 470u cap by 10u cap. The length of the 10u cap leads should kept that long, that the solder pads are accessible on the component side to mount the regulator piggyback style.
Remove the smd resistor.
Solder the 7808 terminals (In,GND,Out) the following way:
In: solder to right pad of the removed R2022 (which points to the flat cable)
GND: solder to the - Pin of C2034
Out: solder to the + Pin of C2034.



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Project: Micro Q / BACK PCB			Date: 19.06.00
Title: HEADPHONE AMP			Rev: 1.1
File: MQBP11B	Dwn by: Th.K.	Dev by: Th.K.	SHT 3 OF 4


CN2010
CN2011
C2034
IC2004
MQBP11

TECHNICAL DOCUMENTATION

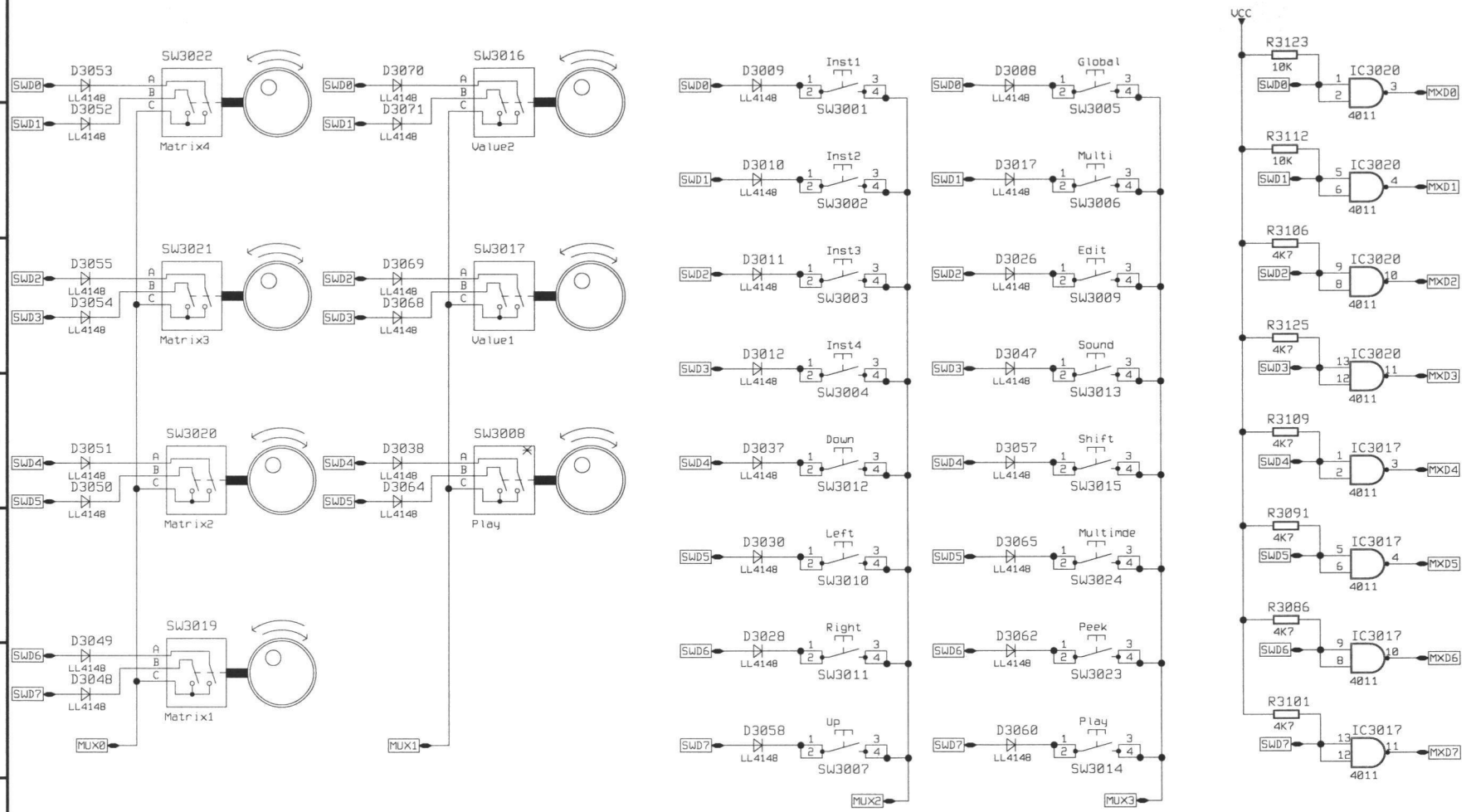
PROJECT: Micro-Q

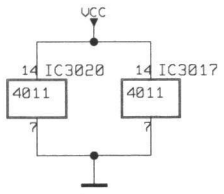
PART : Front / Main PCB
REV : 1.2
DATE : 22.11.00

Document-Name: d_mqmb12.PDF

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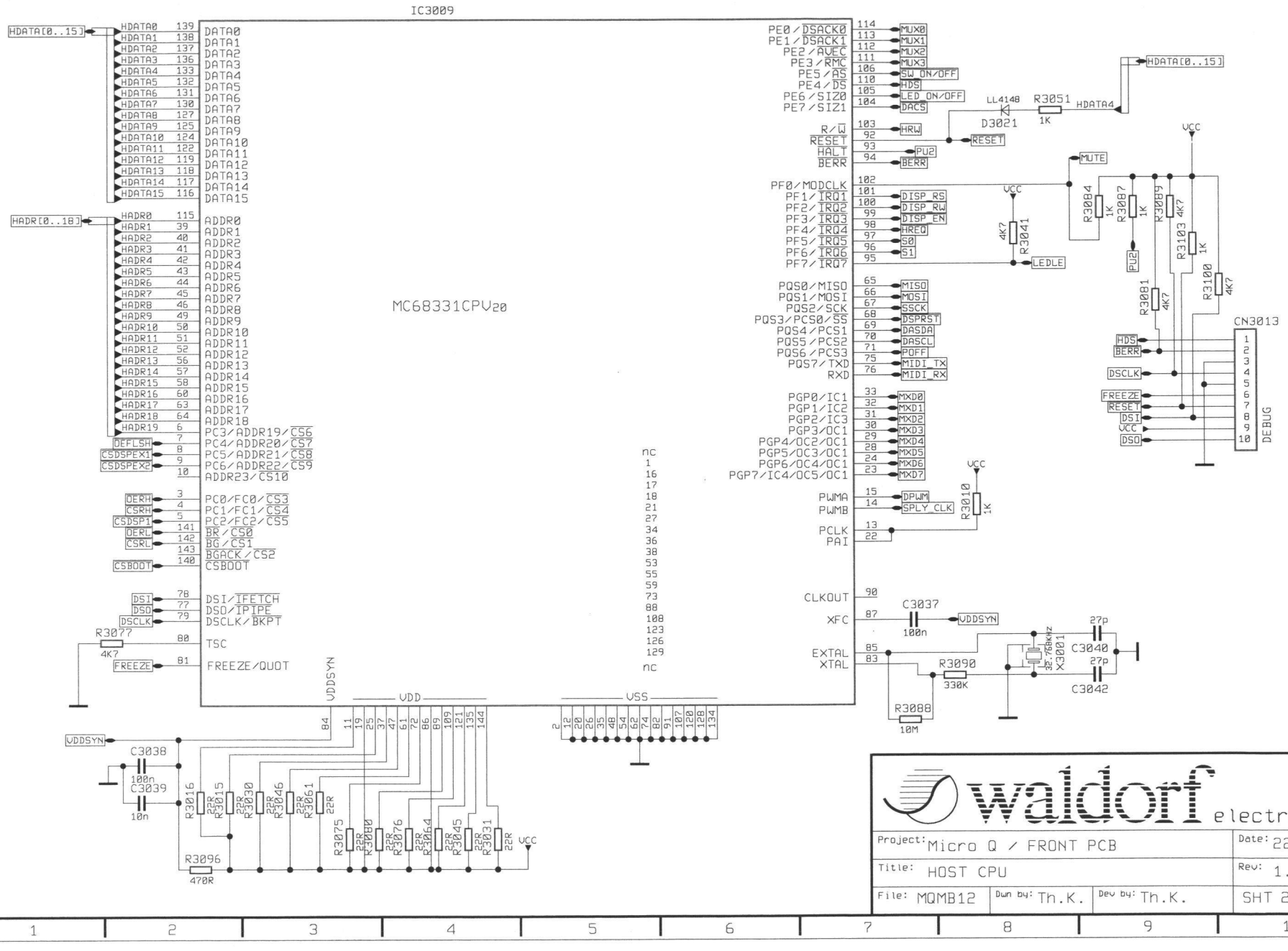
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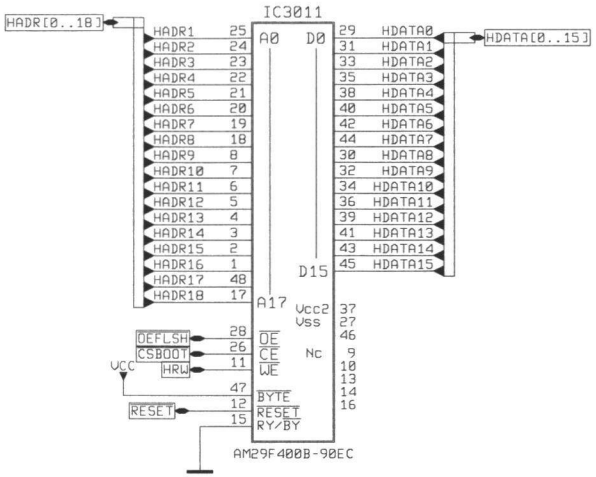


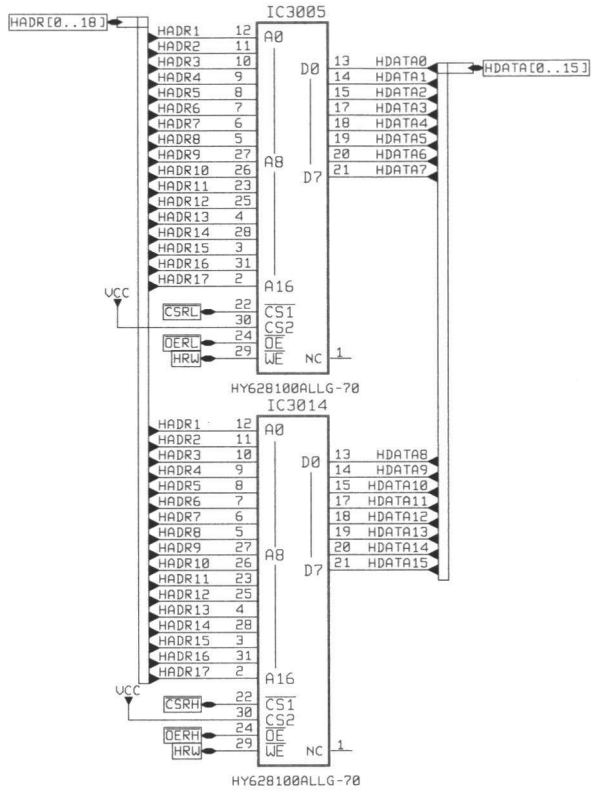
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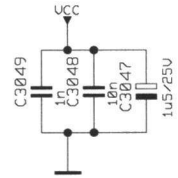
Project: Micro Q / FRONT PCB			Date: 22.11.00
Title: SWITCH MATRIX			Rev: 1.2
File: MQMB12	Dwn by: Th.K.	Dev by: Th.K.	SHT 1 OF 11



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Project: Micro Q / FRONT PCB			Date: 22.11.00
Title: HOST CPU			Rev: 1.2
File: MQMB12	Dwn by: Th.K.	Dev by: Th.K.	SHT 2 OF 11

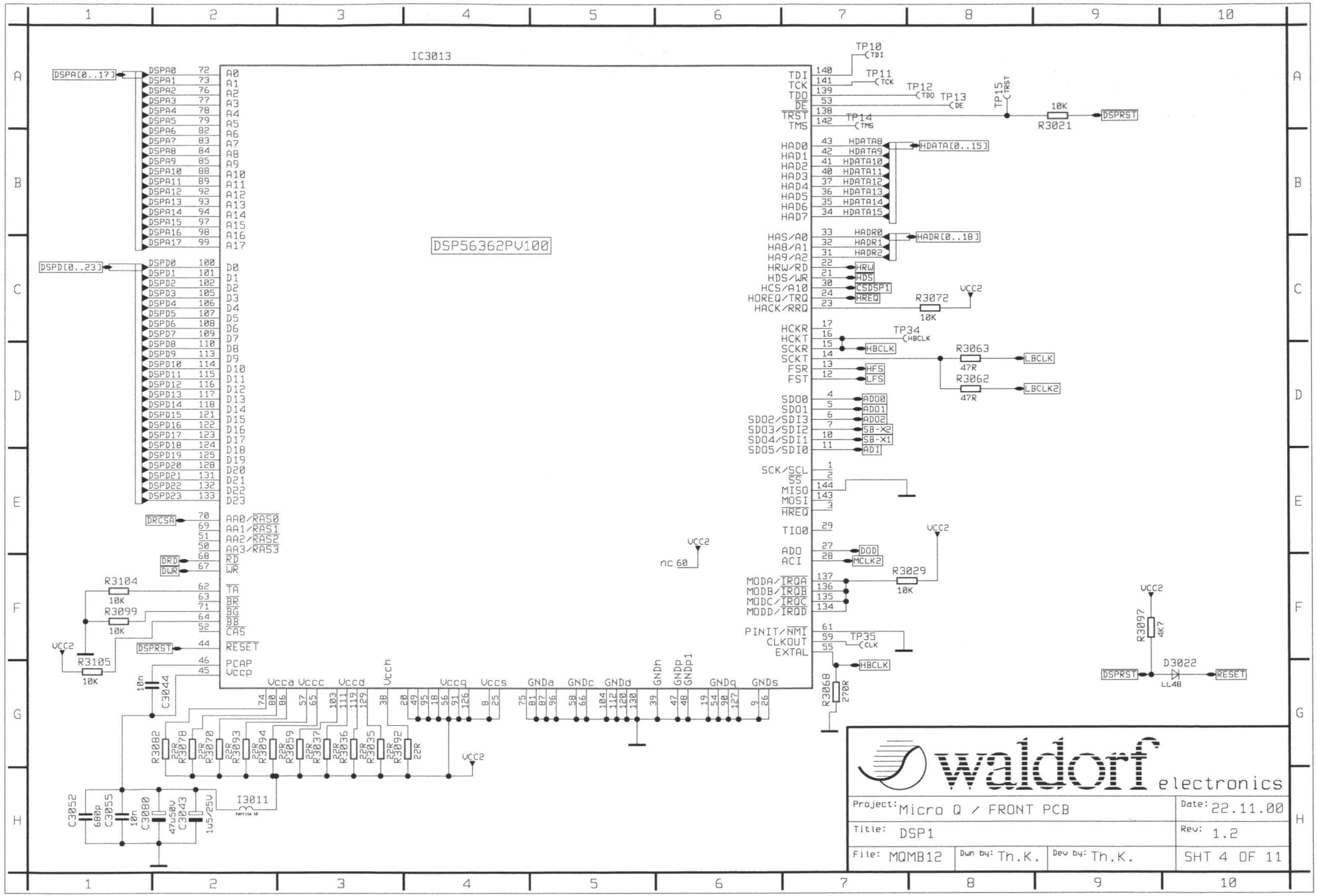


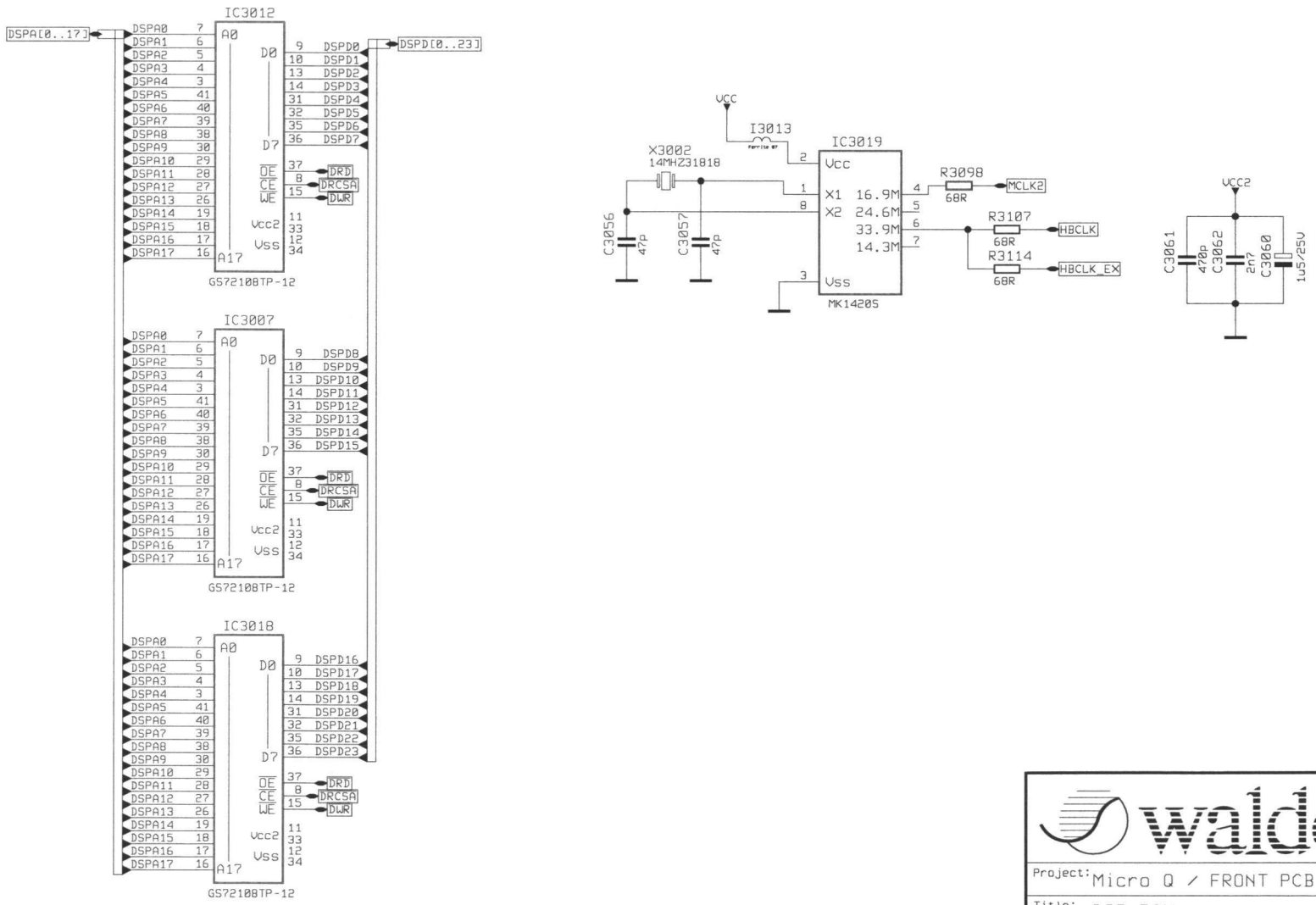




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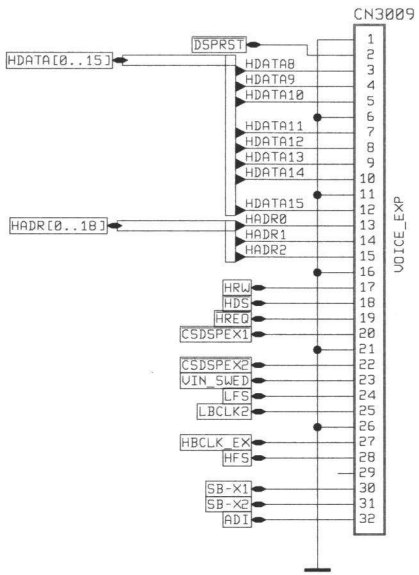
Project: Micro Q / FRONT PCB			Date: 22.11.00
Title: HOST RAM			Rev: 1.2
File: MQMB12	Dwn by: Th.K.	Dev by: Th.K.	SHT 3 OF 11

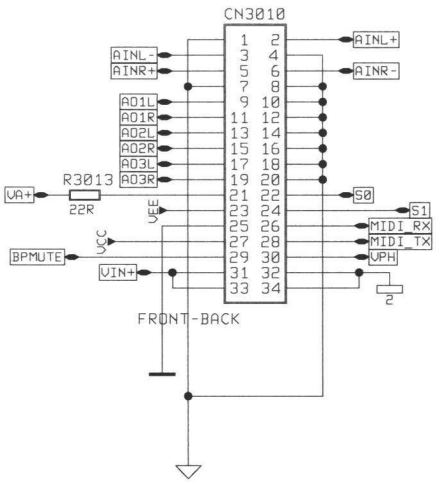

IC3013
DSP56362PV100
DSPA[0..17]
DSPD[0..23]
HDATA[0..15]
HADR[0..18]
DSPRST
HBCLK
LBCLK
LBCLK2
HFS
LFS
HRW
HDS
CSDSP1
HREQ
ADO0
ADO1
ADO2
SB-X2
SB-X1
ADI
DOD
MCLK2
TP10
TP11
TP12
TP13
TP14
TP15
TP34
TP35
R3021
R3072
R3063
R3062
R3029
R3097
R3068
R3104
R3099
R3105
D3022
C3044
C3052
C3055
C3080
C3043
I3011
Vcca Vccc Vccd Vcch Vccq Vccs GNDa GNDc GNDd GNDh GNDp GNDp1 GNDq GNDs
waldorf electronics
Project: Micro Q / FRONT PCB
Date: 22.11.00
Title: DSP1
Rev: 1.2
File: MQMB12
Drwn by: Th.K.
Dev by: Th.K.
SHT 4 OF 11

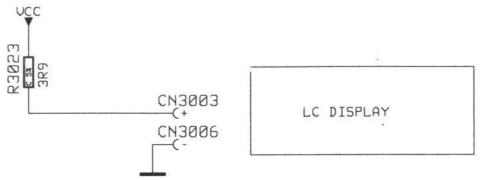


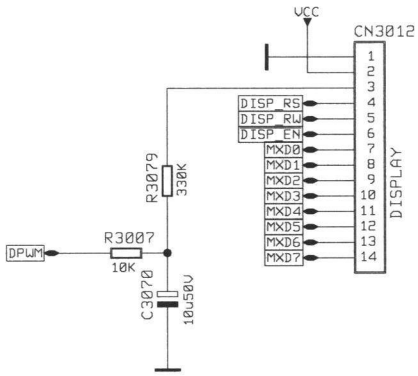
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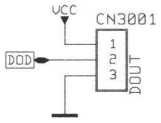
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Title: DSP RAM			Rev: 1.2
File: MQMB12	Dwn by: Th.K.	Dev by: Th.K.	SHT 5 OF 11

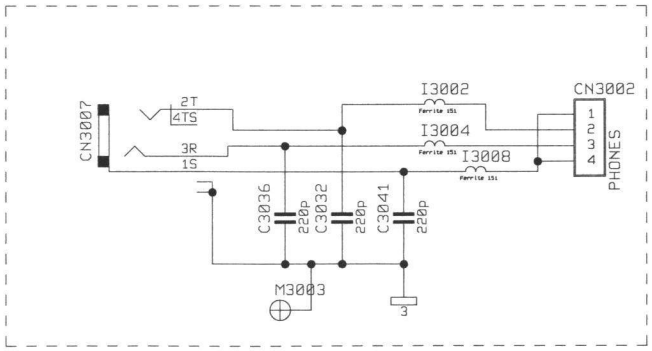


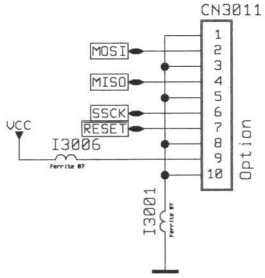






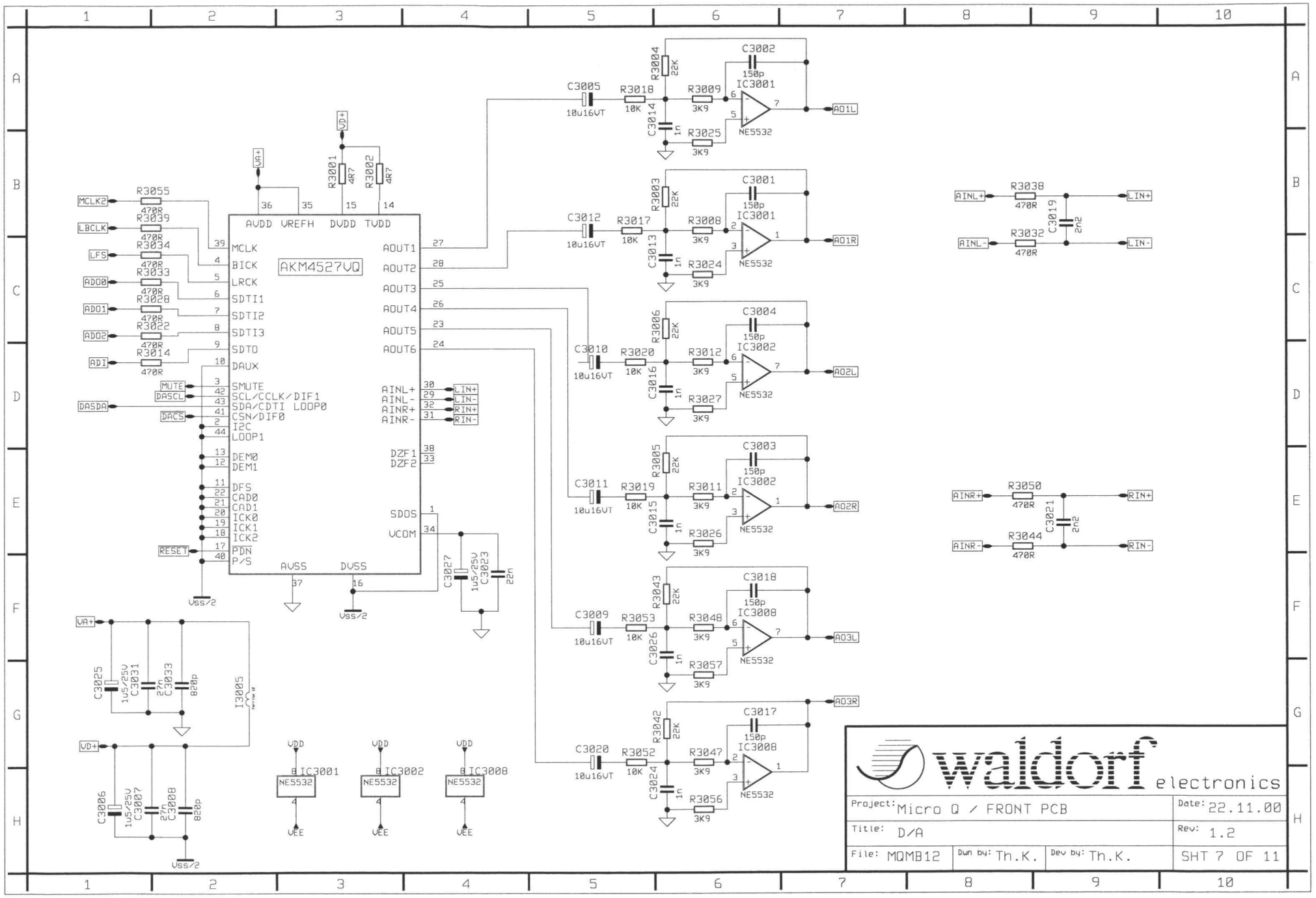




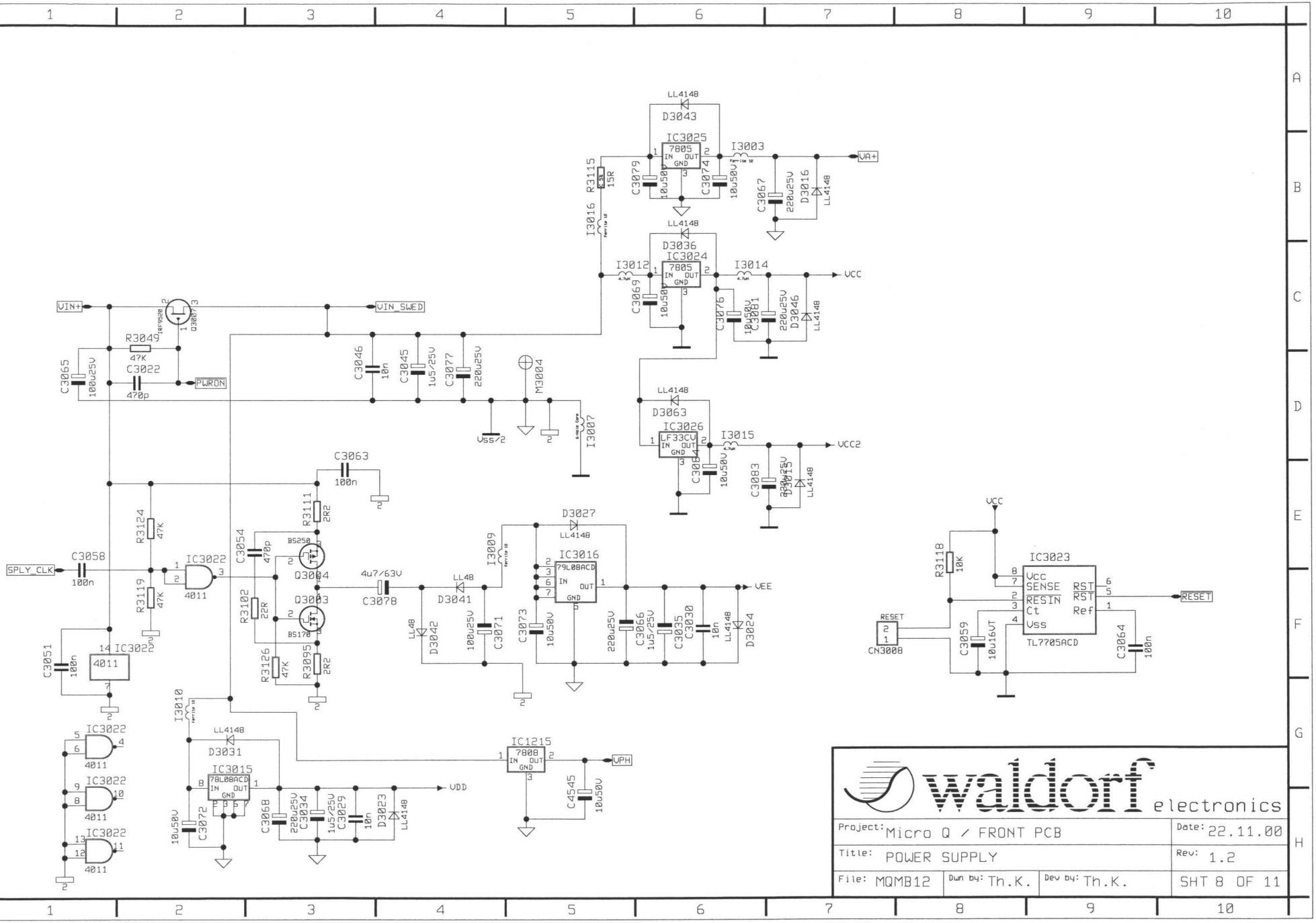


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Project: Micro Q / FRONT PCB			Date: 22.11.00
Title: DSP2			Rev: 1.2
File: MQMB12	Dwn by: Th.K.	Dev by: Th.K.	SHT 6 OF 11

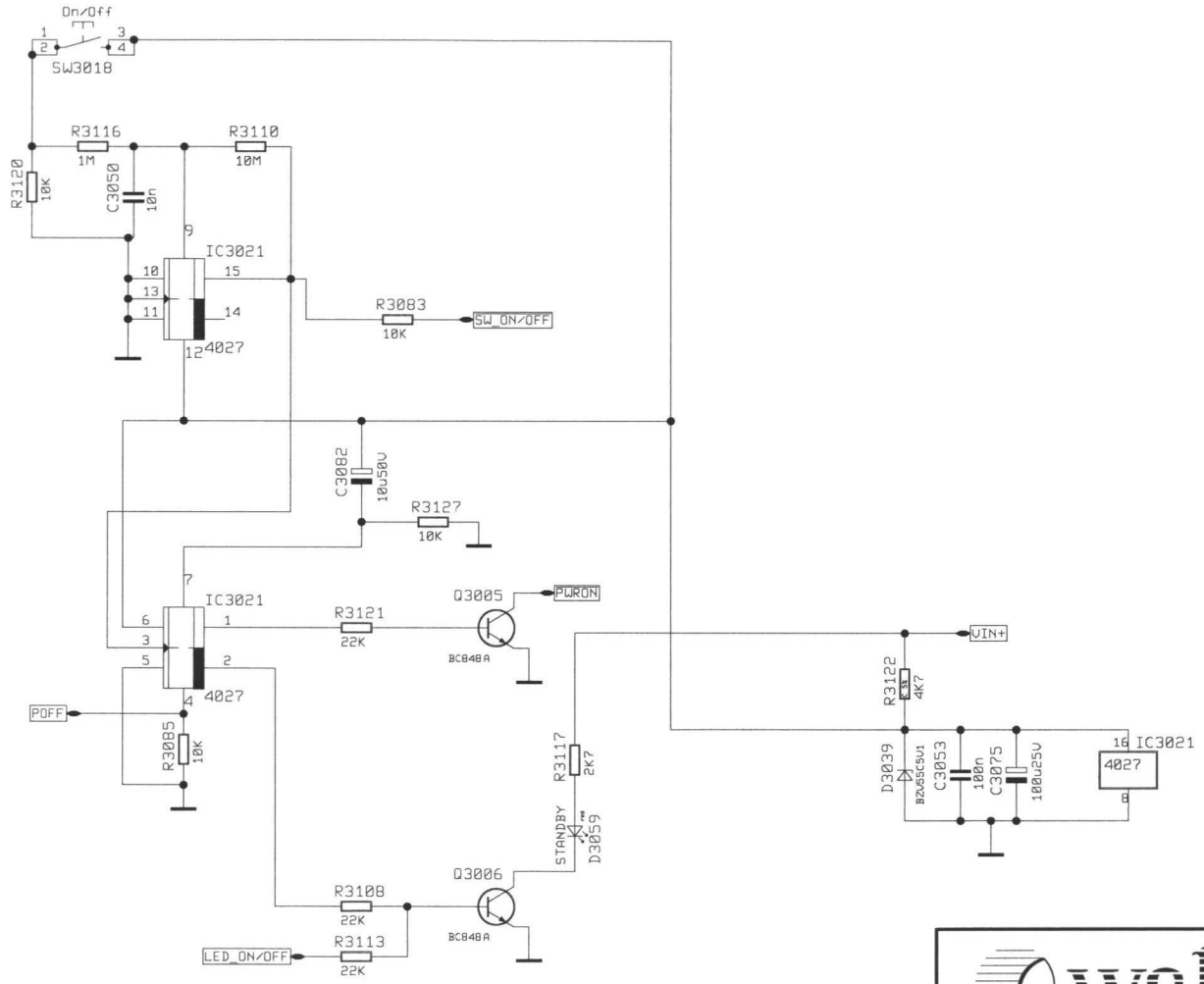


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Project: Micro Q / FRONT PCB			Date: 22.11.00
Title: D/A			Rev: 1.2
File: MQMB12	Dwn by: Th.K.	Dev by: Th.K.	SHT 7 OF 11



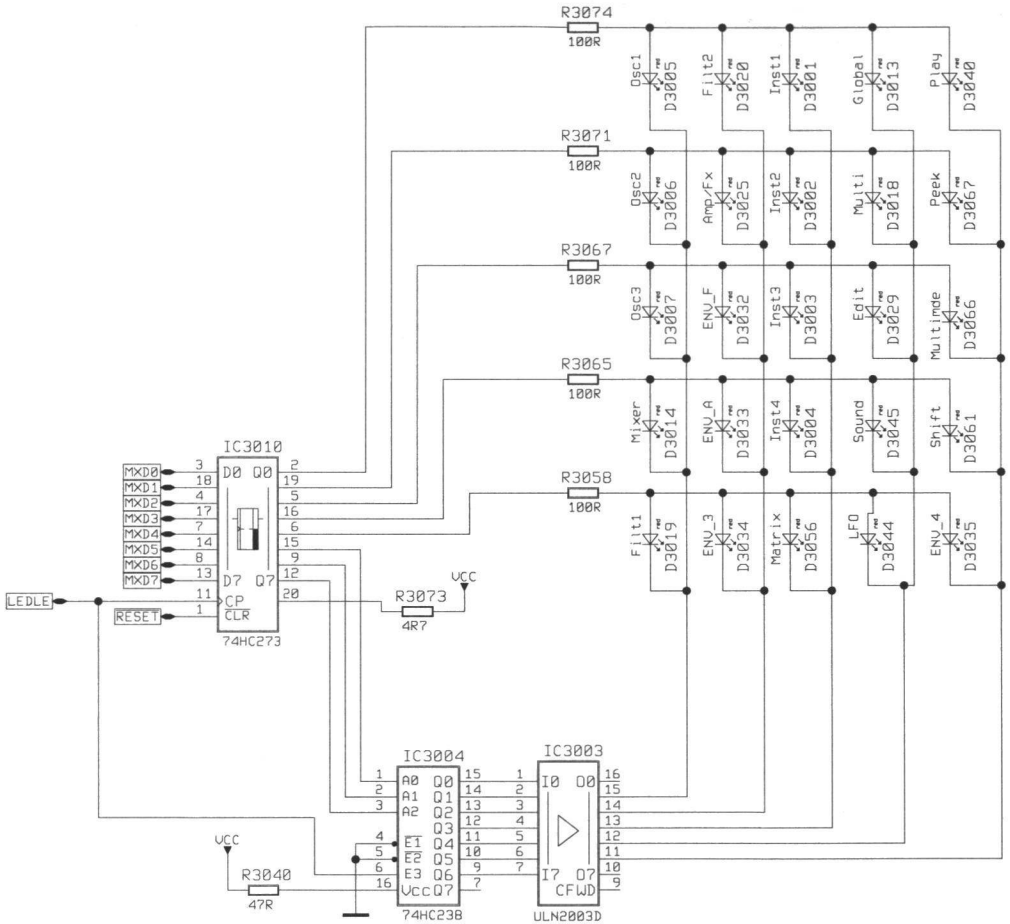
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Project: Micro Q / FRONT PCB			Date: 22.11.00
Title: POWER SUPPLY			Rev: 1.2
File: MQMB12	Dwn by: Th.K.	Dev by: Th.K.	SHT 8 OF 11

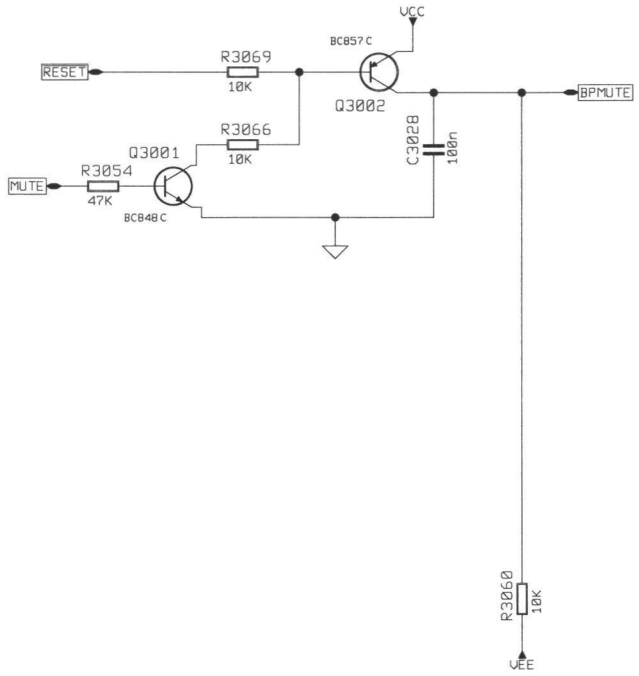


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Project: Micro Q / FRONT PCB			Date: 22.11.00
Title: STANDBY CIRCUITRY			Rev: 1.2
File: MQMB12	Dwn by: Th.K.	Dev by: Th.K.	SHT 9 OF 11



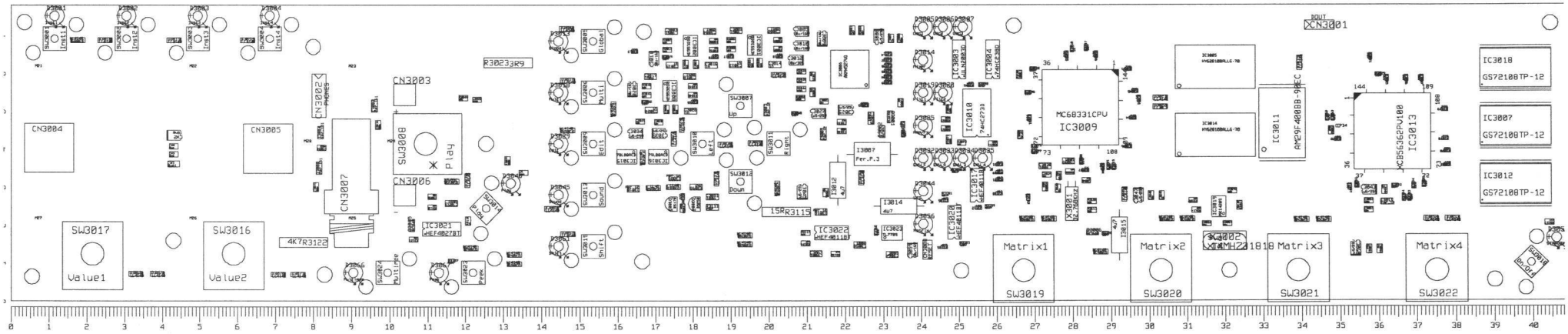
waldorf electronics			
Project: Micro Q / FRONT PCB			Date: 22.11.00
Title: LED MATRIX			Rev: 1.2
File: MQMB12	Dwn by: Th.K.	Dev by: Th.K.	SHT 10 OF 11



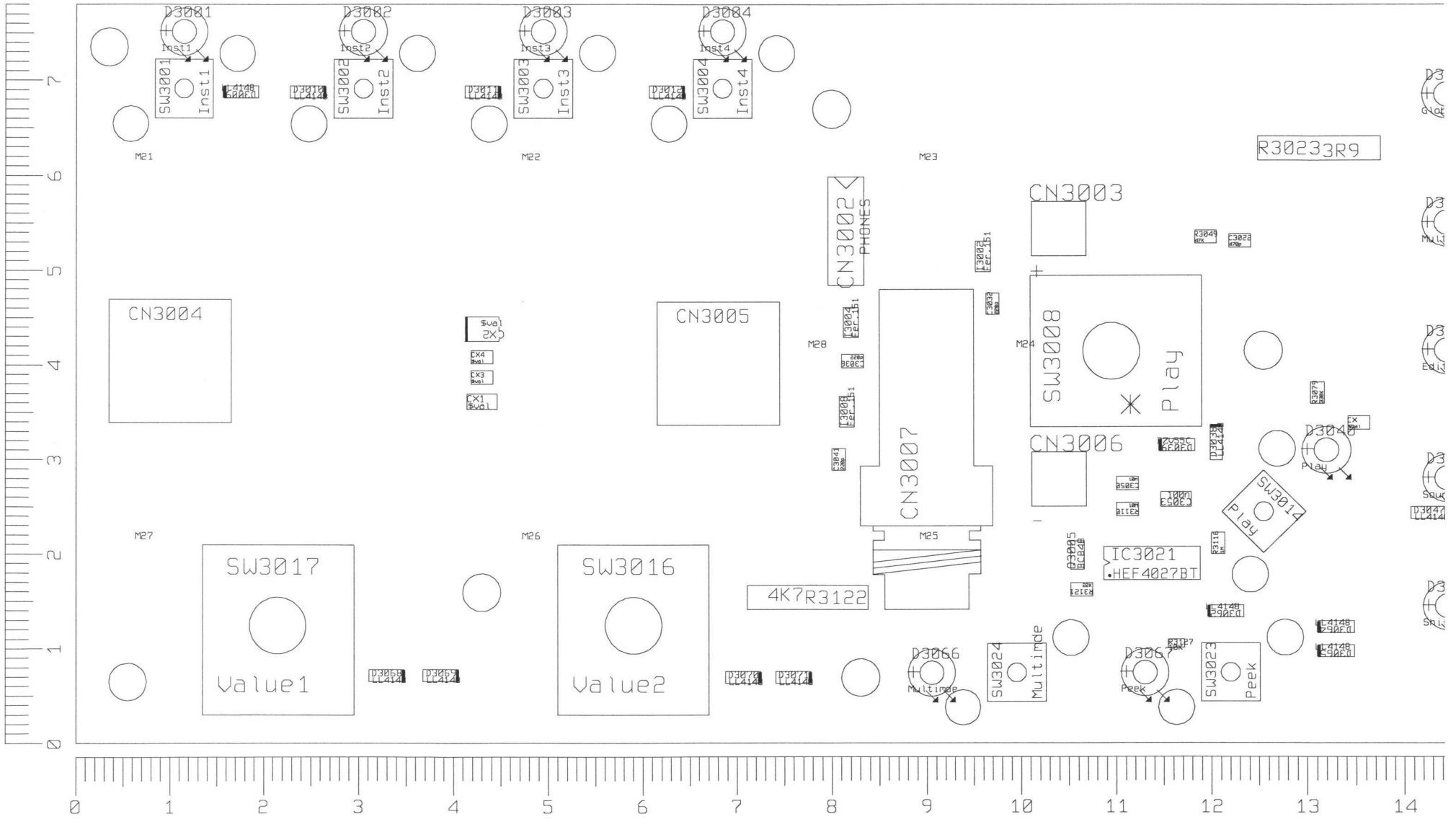
waldorf electronics

Project: Micro Q / FRONT PCB			Date: 22.11.00
Title: AUDIO OUTPUT MUTE			Rev: 1.2
File: MQMB12	Dwn by: Th.K.	Dev by: Th.K.	SHT 11OF 11

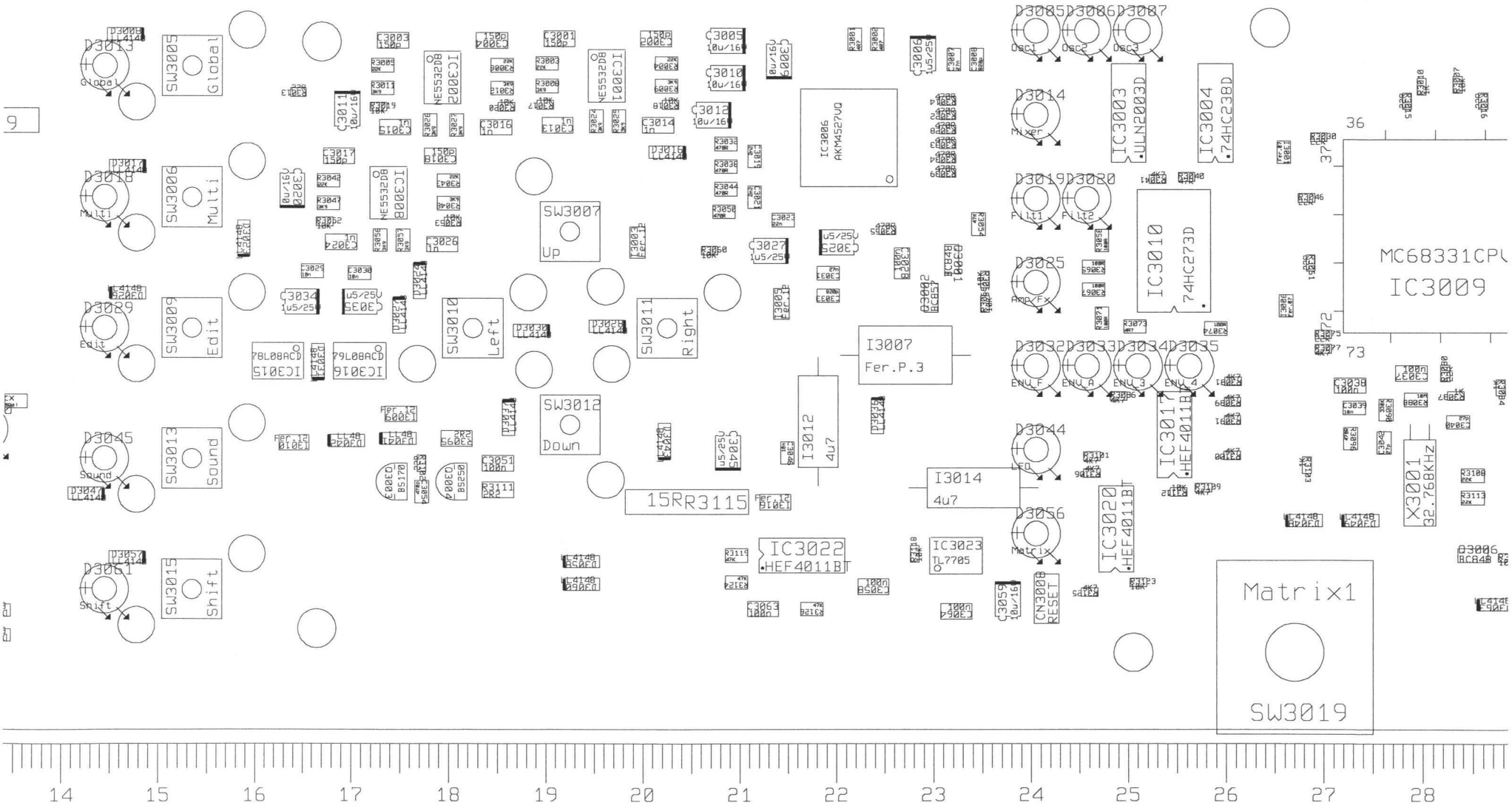
Bestückungsplan MOMB12 22.11.00 Bauteilseite
Leiterpl. Rev. 1.2 Bestückungsrev.1.2

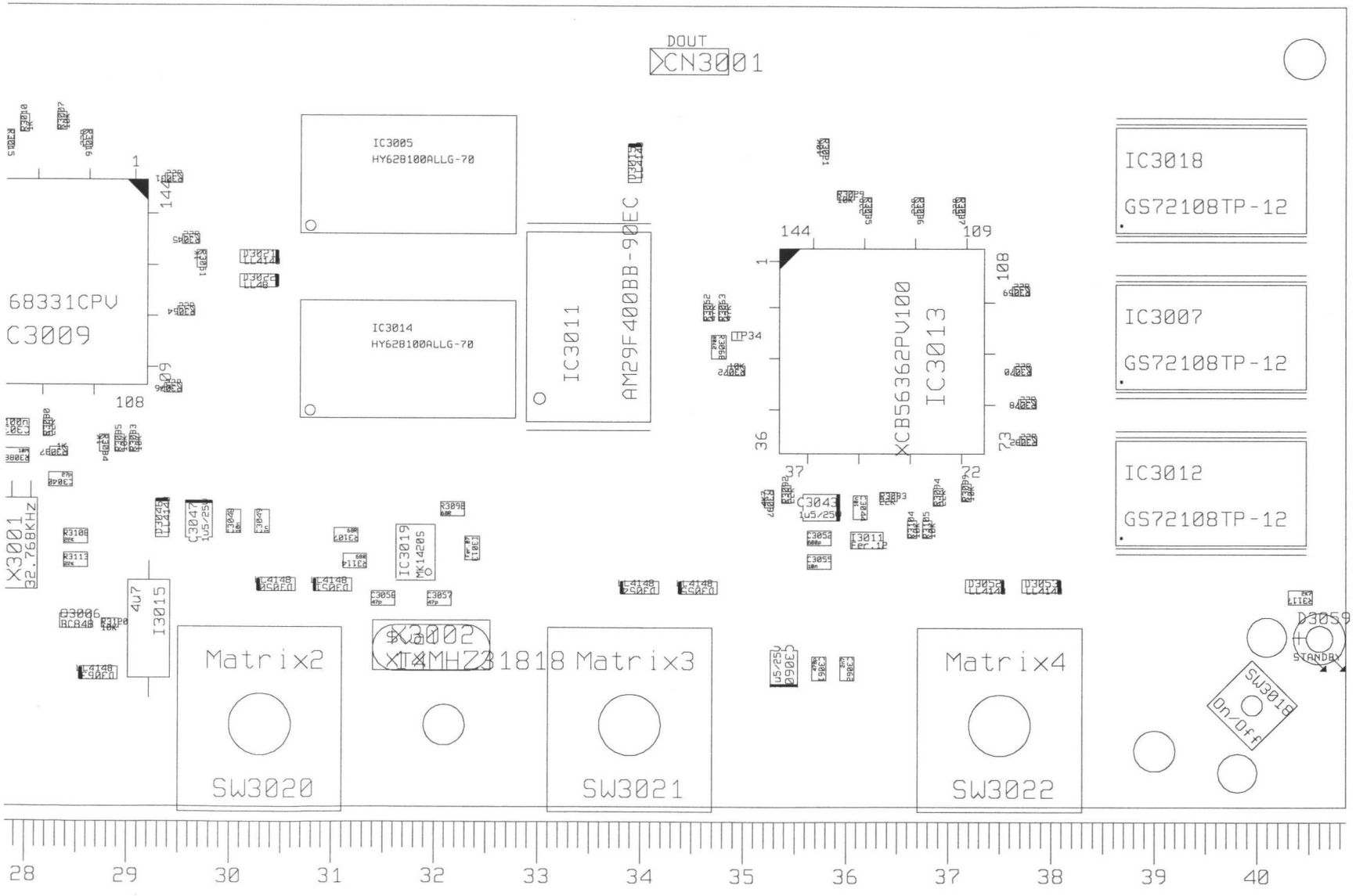


Bestü
Leite

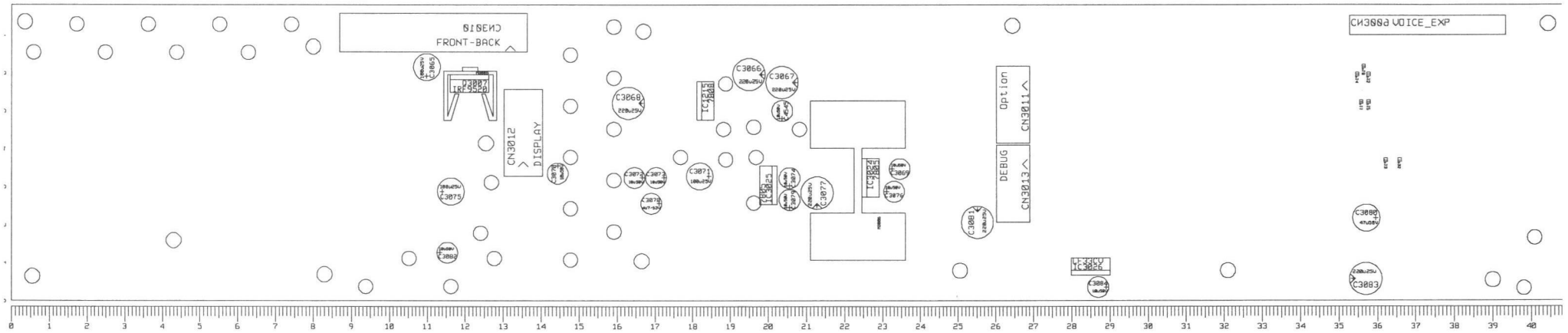

D3081
D3082
D3083
D3084
Inst1
Inst2
Inst3
Inst4
SW3001
SW3002
SW3003
SW3004
M21
M22
M23
R30233R9
CN3002
PHONES
CN3003
CN3004
CN3005
CN3006
CN3007
SW3008
Play
M24
M25
M26
M27
M28
SW3017
Value1
SW3016
Value2
4K7R3122
IC3021
•HEF4027BT
D3066
Multimode
SW3024
Multimode
D3067
Peek
SW3023
Peek
SW3014
Play
D3041
Play
0
1
2
3
4
5
6
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Bestückungsplan MQMB12 22.11.00 Bauteilseite
Leiterpl. Rev. 1.2 Bestückungsrev.1.2

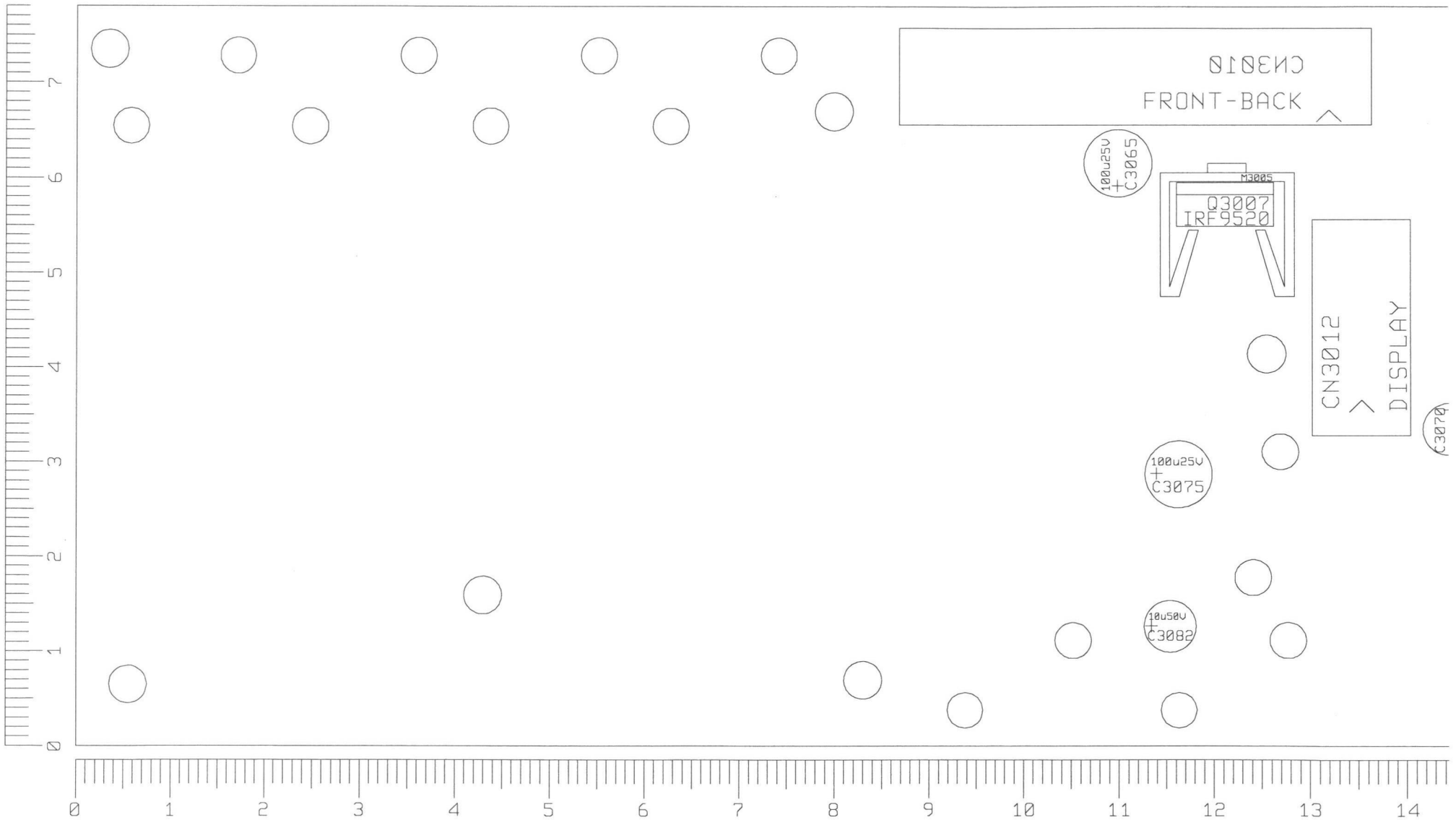



DOUT
CN3001
IC3005
HY62B100ALLG-70
IC3014
HY62B100ALLG-70
IC3011
AM29F400BB-90EC
68331CPV
C3009
IC3013
XCB56362PV100
IC3018
GS72108TP-12
IC3007
GS72108TP-12
IC3012
GS72108TP-12
X3001
32.768KHz
IC3019
MK1420S
X3002
Matrix2
SW3020
Matrix3
SW3021
Matrix4
SW3022
D3059
STANDBY
SW3018
On/Off
28
29
30
31
32
33
34
35
36
37
38
39
40

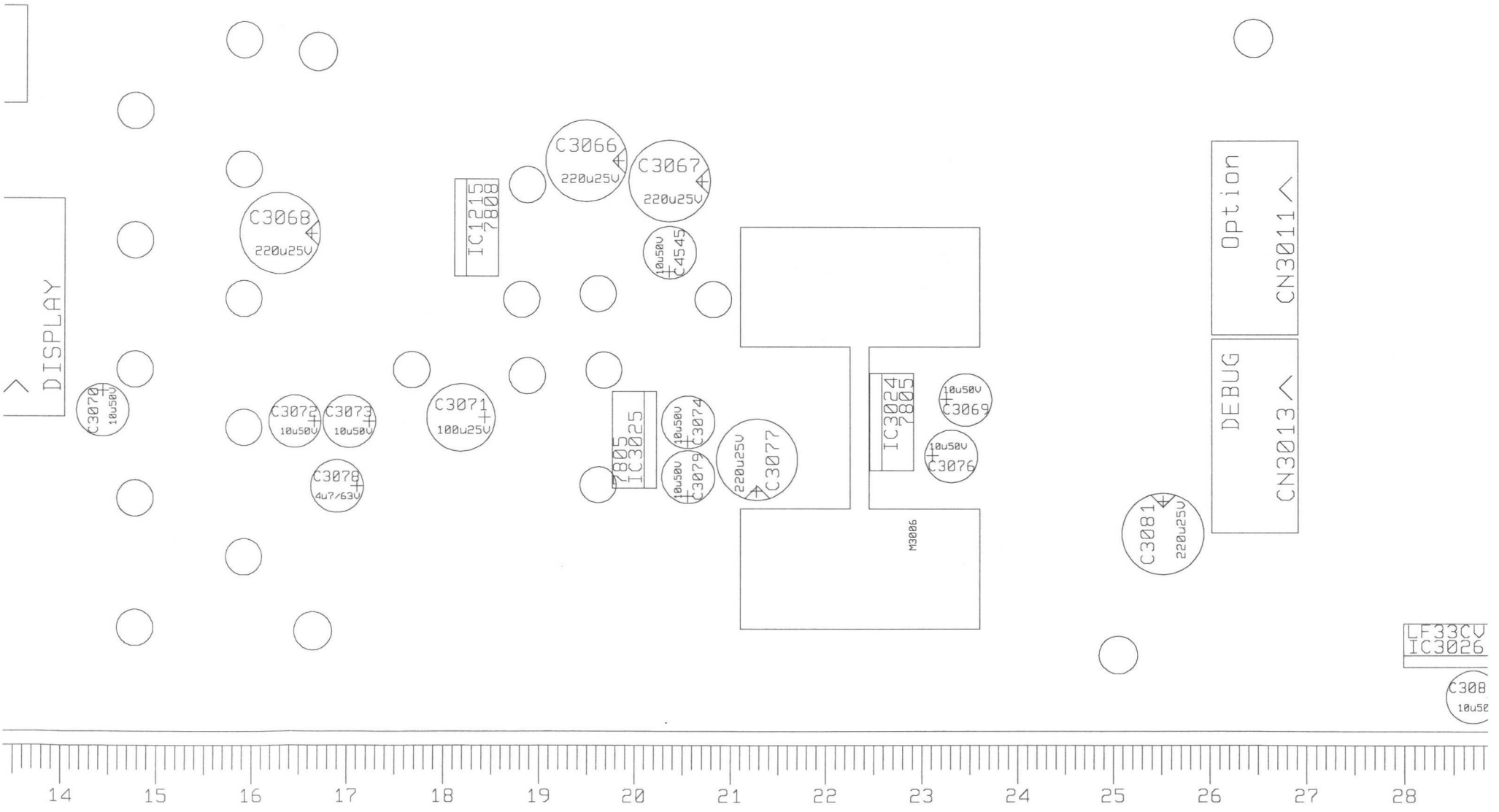
Bestückungsplan MOMB12 22.11.00
Leiterpl. Rev. 1.2 Bestückungsrev.1.2 Leiterseite



Bestü
Leite


CN3010
FRONT-BACK
100u25V
C3065
M3005
Q3007
IRF9520
CN3012
DISPLAY
C3070
100u25V
C3075
10u50V
C3082

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CN3008 VOICE_EXP

J10
J14
J12
J11
J15
J13
J32

C3080
47u50V

LF33CV
IC3026

C3084
10u50V

220u25V
C3083

28 29 30 31 32 33 34 35 36 37 38 39 40

ICs:

PART NO	PART NAME	SUFFIX	DESCRIPTION	PACKAGE	POS X/Y
IC1215	7808		REGULATOR	to220v	184/ 52
IC3001	NE5532D8		HIGH PERFORM. DUAL OP-AMP	so8	196/ 67
IC3002	NE5532D8		HIGH PERFORM. DUAL OP-AMP	so8	179/ 67
IC3003	ULN2003D		DRIVER	so16	250/ 63
IC3004	74HC238D		DECODER	so16	258/ 63
IC3005	HY628100ALLG-70		SRAM 128Kx8 5V	sop32l	317/ 61
IC3006	AKM4527VQ		CODEC, AKM	qfp44	221/ 61
IC3007	GS72108TP-12		SRAM 256Kx8 3.3V 12ns	tsop44_400	395/ 45
IC3008	NE5532D8		HIGH PERFORM. DUAL OP-AMP	so8	173/ 55
IC3009	MC68331CPV	20	68K MICROCONT.	qfp144	281/ 51
IC3010	74HC273D		LATCH	so20	254/ 49
IC3011	AM29F400BB-90EC		FLASH 256Kx16	tsop48	334/ 46
IC3012	GS72108TP-12		SRAM 256Kx8 3.3V 12ns	tsop44_400	395/ 30
IC3013	XCB56362PV100		MOT DSP	qfp144	363/ 44
IC3014	HY628100ALLG-70		SRAM 128Kx8 5V	sop32l	317/ 43
IC3015	78L08ACD		REGULATOR	so8	162/ 38
IC3016	79L08ACD		REGULATOR	so8	170/ 38
IC3017	HEF4011BT		4-fach NAND	so14	254/ 30
IC3018	GS72108TP-12		SRAM 256Kx8 3.3V 12ns	tsop44_400	395/ 61
IC3019	MK1420S		Clock Generator	so8	318/ 24
IC3020	HEF4011BT		4-fach NAND	so14	248/ 20
IC3021	HEF4027BT		DUAL JK-FLIP FLOP	so16	113/ 19
IC3022	HEF4011BT		4-fach NAND	so14	216/ 17
IC3023	TL7705	ACD	RESET IC	so8	232/ 17
IC3024	7805		REGULATOR	to220v	227/ 32
IC3025	7805		REGULATOR	to220v	199/ 30
IC3026	LF33CV		REGULATOR 3,3V	to220v	284/ 9

TRANSISTORs:

PART NO	PART NAME	SUFFIX	DESCRIPTION	PACKAGE	POS X/Y
Q3001	BC848	C	NPN TRANSISTOR SMD	sot23_3	231/ 48
Q3002	BC857	C	PNP TRANSISTOR SMD	sot23_3	229/ 44
Q3003	BS170		N-FET	to92	174/ 23
Q3004	BS250		P-FET	to92	180/ 23
Q3005	BC848	A	NPN TRANSISTOR SMD	sot23_3	105/ 19
Q3006	BC848	A	NPN TRANSISTOR SMD	sot23_3	284/ 17
Q3007	IRF9520		POWER P-FET	to220v	121/ 56

DIODEs:

PART NO	PART NAME	SUFFIX	DESCRIPTION	PACKAGE	POS X/Y
D3008	LL4148		DIODE	MINIMELF_D	146/ 71
D3009	LL4148		DIODE	MINIMELF_D	17/ 68
D3010	LL4148		DIODE	MINIMELF_D	24/ 68
D3011	LL4148		DIODE	MINIMELF_D	43/ 68
D3012	LL4148		DIODE	MINIMELF_D	62/ 68
D3015	LL4148		DIODE	MINIMELF_D	339/ 62
D3016	LL4148		DIODE	MINIMELF_D	202/ 59
D3017	LL4148		DIODE	MINIMELF_D	146/ 58
D3021	LL4148		DIODE	MINIMELF_D	302/ 53
D3022	LL48		SCHOTTKY-DIODE	MINIMELF_D	302/ 51
D3023	LL4148		DIODE	MINIMELF_D	158/ 50
D3024	LL4148		DIODE	MINIMELF_D	177/ 46
D3026	LL4148		DIODE	MINIMELF_D	146/ 45
D3027	LL4148		DIODE	MINIMELF_D	174/ 42

DIODEs: (continued)

PART NO	PART NAME	SUFFIX	DESCRIPTION	PACKAGE	POS X/Y
D3028	LL4148		DIODE	MINIMELF_D	196/ 41
D3030	LL4148		DIODE	MINIMELF_D	188/ 41
D3031	LL4148		DIODE	MINIMELF_D	166/ 38
D3036	LL4148		DIODE	MINIMELF_D	224/ 32
D3037	LL4148		DIODE	MINIMELF_D	186/ 32
D3038	LL4148		DIODE	MINIMELF_D	120/ 31
D3039	BZV55C	5V1	ZENER DIODE 0.5W SMD	MINIMELF_D	116/ 31
D3041	LL48		SCHOTTKY-DIODE	MINIMELF_D	174/ 30
D3042	LL48		SCHOTTKY-DIODE	MINIMELF_D	169/ 29
D3043	LL4148		DIODE	MINIMELF_D	202/ 29
D3046	LL4148		DIODE	MINIMELF_D	293/ 27
D3047	LL4148		DIODE	MINIMELF_D	142/ 24
D3048	LL4148		DIODE	MINIMELF_D	268/ 21
D3049	LL4148		DIODE	MINIMELF_D	273/ 21
D3050	LL4148		DIODE	MINIMELF_D	304/ 21
D3051	LL4148		DIODE	MINIMELF_D	310/ 21
D3052	LL4148		DIODE	MINIMELF_D	373/ 21
D3053	LL4148		DIODE	MINIMELF_D	378/ 21
D3054	LL4148		DIODE	MINIMELF_D	340/ 21
D3055	LL4148		DIODE	MINIMELF_D	345/ 21
D3057	LL4148		DIODE	MINIMELF_D	146/ 17
D3058	LL4148		DIODE	MINIMELF_D	193/ 17
D3060	LL4148		DIODE	MINIMELF_D	193/ 15
D3062	LL4148		DIODE	MINIMELF_D	121/ 13
D3063	LL4148		DIODE	MINIMELF_D	287/ 12
D3064	LL4148		DIODE	MINIMELF_D	132/ 12
D3065	LL4148		DIODE	MINIMELF_D	132/ 9
D3068	LL4148		DIODE	MINIMELF_D	32/ 7
D3069	LL4148		DIODE	MINIMELF_D	38/ 7
D3070	LL4148		DIODE	MINIMELF_D	70/ 6
D3071	LL4148		DIODE	MINIMELF_D	75/ 6

LEDs:

PART NO	PART NAME	DESCRIPTION	FUNCTION	PACKAGE	POS X/Y
D3001	CQX 25N	LED 3mm rot klar	Inst1	led	11/ 75
D3002	CQX 25N	LED 3mm rot klar	Inst2	led	30/ 75
D3003	CQX 25N	LED 3mm rot klar	Inst3	led	49/ 75
D3004	CQX 25N	LED 3mm rot klar	Inst4	led	68/ 75
D3005	CQX 25N	LED 3mm rot klar	Osc1	led	240/ 72
D3006	CQX 25N	LED 3mm rot klar	Osc2	led	245/ 72
D3007	CQX 25N	LED 3mm rot klar	Osc3	led	251/ 72
D3013	CQX 25N	LED 3mm rot klar	Global	led	144/ 68
D3014	CQX 25N	LED 3mm rot klar	Mixer	led	240/ 63
D3018	CQX 25N	LED 3mm rot klar	Multi	led	144/ 54
D3019	CQX 25N	LED 3mm rot klar	Filt1	led	240/ 54
D3020	CQX 25N	LED 3mm rot klar	Filt2	led	245/ 54
D3025	CQX 25N	LED 3mm rot klar	Amp/Fx	led	240/ 46
D3029	CQX 25N	LED 3mm rot klar	Edit	led	144/ 41
D3032	CQX 25N	LED 3mm rot klar	ENV_F	led	240/ 37
D3033	CQX 25N	LED 3mm rot klar	ENV_A	led	245/ 37
D3034	CQX 25N	LED 3mm rot klar	ENV_3	led	251/ 37
D3035	CQX 25N	LED 3mm rot klar	ENV_4	led	256/ 37
D3040	CQX 25N	LED 3mm rot klar	Play	led	131/ 31
D3044	CQX 25N	LED 3mm rot klar	LFO	led	240/ 28
D3045	CQX 25N	LED 3mm rot klar	Sound	led	144/ 27

LEDs: (continued)

PART NO	PART NAME	DESCRIPTION	FUNCTION	PACKAGE	POS X/Y
D3056	CQX 25N	LED 3mm rot klar	Matrix	led	240/ 20
D3059	CQX 25N	LED 3mm rot klar	STANDBY	led	406/ 16
D3061	CQX 25N	LED 3mm rot klar	Shift	led	144/ 14
D3066	CQX 25N	LED 3mm rot klar	Multimde	led	90/ 7
D3067	CQX 25N	LED 3mm rot klar	Peek	led	112/ 7

CAPACITORs:

PART NO	VALUE	DESCRIPTION		POS X/Y
C3001	150p	KER. NPO 5% 63V	TYP1 NPO SMD1206	191/ 71
C3002	150p	KER. NPO 5% 63V	TYP1 NPO SMD1206	201/ 71
C3003	150p	KER. NPO 5% 63V	TYP1 NPO SMD1206	174/ 71
C3004	150p	KER. NPO 5% 63V	TYP1 NPO SMD1206	184/ 71
C3005	10u/16V	TANTAL 20%	SMD B	208/ 71
C3006	1u5/25V	TANTAL 20%	SMD B	228/ 69
C3007	27n	KER.VIELS.10% 63V	TYP2 X7R SMD0805	232/ 69
C3008	820p	KER.VIELS.10% 63V	TYP2 X7R SMD0805	234/ 69
C3009	10u/16V	TANTAL 20%	SMD B	214/ 69
C3010	10u/16V	TANTAL 20%	SMD B	208/ 67
C3011	10u/16V	TANTAL 20%	SMD B	169/ 64
C3012	10u/16V	TANTAL 20%	SMD B	207/ 63
C3013	1n	KERKO 5% 63V	TYP1 COG SMD1206	191/ 62
C3014	1n	KERKO 5% 63V	TYP1 COG SMD1206	201/ 62
C3015	1n	KERKO 5% 63V	TYP1 COG SMD1206	174/ 62
C3016	1n	KERKO 5% 63V	TYP1 COG SMD1206	184/ 62
C3017	150p	KER. NPO 5% 63V	TYP1 NPO SMD1206	168/ 59
C3018	150p	KER. NPO 5% 63V	TYP1 NPO SMD1206	179/ 59
C3019	2n2	KER.VIELS.10% 63V	TYP2 X7R SMD0805	211/ 59
C3020	10u/16V	TANTAL 20%	SMD B	163/ 55
C3021	2n2	KER.VIELS.10% 63V	TYP2 X7R SMD0805	211/ 55
C3022	470p	KER.VIELS.10% 63V	TYP2 X7R SMD0805	123/ 53
C3023	22n	KER.VIELS.10% 63V	TYP2 X7R SMD0805	214/ 52
C3024	1n	KERKO 5% 63V	TYP1 COG SMD1206	168/ 50
C3025	1u5/25V	TANTAL 20%	SMD B	219/ 50
C3026	1n	KERKO 5% 63V	TYP1 COG SMD1206	179/ 50
C3027	1u5/25V	TANTAL 20%	SMD B	213/ 49
C3028	100n	KER. VIELSCH. 15%	TYP2 X7R SMD1206	226/ 48
C3029	10n	KER.VIELSCH.10% 63V	TYP2 X7R SMD0805	166/ 47
C3030	10n	KER.VIELSCH.10% 63V	TYP2 X7R SMD0805	170/ 47
C3031	27n	KER.VIELS.10% 63V	TYP2 X7R SMD0805	219/ 47
C3032	220p	KER.VIELS.10% 63V	TYP2 X7R SMD0805	96/ 46
C3033	820p	KER.VIELS.10% 63V	TYP2 X7R SMD0805	219/ 44
C3034	1u5/25V	TANTAL 20%	SMD B	164/ 44
C3035	1u5/25V	TANTAL 20%	SMD B	170/ 44
C3036	220p	KER.VIELS.10% 63V	TYP2 X7R SMD0805	82/ 40
C3037	100n	KER. VIELSCH. 15%	TYP2 X7R SMD1206	278/ 36
C3038	100n	KER. VIELSCH. 15%	TYP2 X7R SMD1206	272/ 35
C3039	10n	KER.VIELSCH.10% 63V	TYP2 X7R SMD0805	273/ 33
C3040	27p	KERKO 5% 63V	TYP1 COG SMD0805	283/ 31
C3041	220p	KER.VIELS.10% 63V	TYP2 X7R SMD0805	80/ 30
C3042	27p	KERKO 5% 63V	TYP1 COG SMD0805	276/ 29
C3043	1u5/25V	TANTAL 20%	SMD B	357/ 29
C3044	10n	KER.VIELSCH.10% 63V	TYP2 X7R SMD0805	361/ 29
C3045	1u5/25V	TANTAL 20%	SMD B	208/ 28
C3046	10n	KER.VIELSCH.10% 63V	TYP2 X7R SMD0805	214/ 28
C3047	1u5/25V	TANTAL 20%	SMD B	297/ 27

CAPACITORs: (continued)

PART NO	VALUE	DESCRIPTION		POS X/Y
C3048	10n	KER.VIELSCH.10% 63V	TYP2 X7R SMD0805	300/ 27
C3049	1n	KER.VIELS.10% 63V	TYP2 X7R SMD0805	303/ 27
C3050	10n	KER.VIELSCH.10% 63V	TYP2 X7R SMD0805	111/ 27
C3051	100n	KER. VIELSCH. 15%	TYP2 X7R SMD1206	185/ 27
C3052	680p	KER.VIELS.10% 63V	TYP2 X7R SMD0805	357/ 26
C3053	100n	KER. VIELSCH. 15%	TYP2 X7R SMD1206	116/ 25
C3054	470p	KER.VIELS.10% 63V	TYP2 X7R SMD0805	177/ 24
C3055	10n	KER.VIELSCH.10% 63V	TYP2 X7R SMD0805	357/ 23
C3056	47p	KERKO 5% 63V	TYP1 COG SMD0805	315/ 20
C3057	47p	KERKO 5% 63V	TYP1 COG SMD0805	320/ 20
C3058	100n	KER. VIELSCH. 15%	TYP2 X7R SMD1206	223/ 14
C3059	10u/16V	TANTAL 20%	SMD B	237/ 13
C3060	1u5/25V	TANTAL 20%	SMD B	353/ 13
C3061	470p	KER.VIELS.10% 63V	TYP2 X7R SMD0805	357/ 13
C3062	2n7	KER.VIELS.10% 63V	TYP2 X7R SMD0805	360/ 13
C3063	100n	KER. VIELSCH. 15%	TYP2 X7R SMD1206	212/ 12
C3064	100n	KER. VIELSCH. 15%	TYP2 X7R SMD1206	232/ 12
C3065	100u25V	ELKO RADIAL	RM2.5 d=7	109/ 60
C3066	220u25V	ELKO RADIAL	RM3.5 d=8	194/ 59
C3067	220u25V	ELKO RADIAL	RM3.5 d=8	203/ 57
C3068	220u25V	ELKO RADIAL	RM3.5 d=8	162/ 52
C3069	10u50V	ELKO RADIAL 20%	RM2.0 d=5	233/ 34
C3070	10u50V	ELKO RADIAL 20%	RM2.0 d=5	144/ 34
C3071	100u25V	ELKO RADIAL	RM2.5 d=7	183/ 32
C3072	10u50V	ELKO RADIAL 20%	RM2.0 d=5	165/ 32
C3073	10u50V	ELKO RADIAL 20%	RM2.0 d=5	171/ 32
C3074	10u50V	ELKO RADIAL 20%	RM2.0 d=5	205/ 31
C3075	100u25V	ELKO RADIAL	RM2.5 d=7	115/ 28
C3076	10u50V	ELKO RADIAL 20%	RM2.0 d=5	232/ 28
C3077	220u25V	ELKO RADIAL	RM3.5 d=8	212/ 28
C3078	4u7/63V	ELKO RADIAL 20%	RM2.0 d=5	170/ 25
C3079	10u50V	ELKO RADIAL 20%	RM2.0 d=5	205/ 25
C3080	47u50V	ELKO RADIAL 20%	RM2.5 d=7	358/ 21
C3081	220u25V	ELKO RADIAL	RM3.5 d=8	255/ 20
C3082	10u50V	ELKO RADIAL 20%	RM2.0 d=5	114/ 12
C3083	220u25V	ELKO RADIAL	RM3.5 d=8	357/ 5
C3084	10u50V	ELKO RADIAL 20%	RM2.0 d=5	287/ 3
C4545	10u50V	ELKO RADIAL 20%	RM2.0 d=5	203/ 49

RESISTORs:

PART NO	VALUE	DESCRIPTION		POS X/Y
R3001	4R7	CHIP-WIDERST. TK200	5% 0.125W 0805	221/ 71
R3002	4R7	CHIP-WIDERST. TK200	5% 0.125W 0805	224/ 71
R3003	22K	MET.SMD.WID 0805	1% 0.125W TK50	190/ 68
R3004	22K	MET.SMD.WID 0805	1% 0.125W TK50	202/ 68
R3005	22K	MET.SMD.WID 0805	1% 0.125W TK50	173/ 68
R3006	22K	MET.SMD.WID 0805	1% 0.125W TK50	185/ 68
R3007	10K	CHIP-WIDERST. TK200	5% 0.1W 0603	283/ 66
R3008	3K9	MET.SMD.WID 0805	1% 0.125W TK50	190/ 66
R3009	3K9	MET.SMD.WID 0805	1% 0.125W TK50	202/ 66
R3010	1K	CHIP-WIDERST. TK200	5% 0.1W 0603	279/ 66
R3011	3K9	MET.SMD.WID 0805	1% 0.125W TK50	173/ 66
R3012	3K9	MET.SMD.WID 0805	1% 0.125W TK50	185/ 66
R3013	22R	CHIP-WIDERST. TK200	5% 0.1W 0603	164/ 65
R3014	470R	CHIP-WIDERST. TK200	5% 0.1W 0603	231/ 64

RESISTORs: (continued)

PART NO	VALUE	DESCRIPTION		POS X/Y
R3015	22R	CHIP-WIDERST. TK200	5% 0.1W 0603	278/ 64
R3016	22R	CHIP-WIDERST. TK200	5% 0.1W 0603	286/ 64
R3017	10K	CHIP-WIDERST. TK200	5% 0.1W 0603	189/ 64
R3018	10K	CHIP-WIDERST. TK200	5% 0.1W 0603	202/ 64
R3019	10K	CHIP-WIDERST. TK200	5% 0.1W 0603	172/ 64
R3020	10K	CHIP-WIDERST. TK200	5% 0.1W 0603	185/ 64
R3021	10K	CHIP-WIDERST. TK200	5% 0.1W 0603	357/ 64
R3022	470R	CHIP-WIDERST. TK200	5% 0.1W 0603	231/ 63
R3023	3R9	KOHLE-SCHICHTW. 0207	5% 0.25W TK200	126/ 62
R3024	3K9	MET.SMD.WID 0805	1% 0.125W TK50	195/ 62
R3025	3K9	MET.SMD.WID 0805	1% 0.125W TK50	197/ 62
R3026	3K9	MET.SMD.WID 0805	1% 0.125W TK50	178/ 62
R3027	3K9	MET.SMD.WID 0805	1% 0.125W TK50	180/ 62
R3028	470R	CHIP-WIDERST. TK200	5% 0.1W 0603	231/ 62
R3029	10K	CHIP-WIDERST. TK200	5% 0.1W 0603	359/ 59
R3030	22R	CHIP-WIDERST. TK200	5% 0.1W 0603	269/ 61
R3031	22R	CHIP-WIDERST. TK200	5% 0.1W 0603	294/ 61
R3032	470R	CHIP-WIDERST. TK200	5% 0.125W 0805	208/ 60
R3033	470R	CHIP-WIDERST. TK200	5% 0.1W 0603	231/ 60
R3034	470R	CHIP-WIDERST. TK200	5% 0.1W 0603	231/ 59
R3035	22R	CHIP-WIDERST. TK200	5% 0.1W 0603	362/ 58
R3036	22R	CHIP-WIDERST. TK200	5% 0.1W 0603	367/ 58
R3037	22R	CHIP-WIDERST. TK200	5% 0.1W 0603	371/ 58
R3038	470R	CHIP-WIDERST. TK200	5% 0.125W 0805	208/ 58
R3039	470R	CHIP-WIDERST. TK200	5% 0.1W 0603	231/ 57
R3040	47R	CHIP-WIDERST. TK200	5% 0.1W 0603	255/ 57
R3041	4K7	CHIP-WIDERST. TK200	5% 0.1W 0603	253/ 56
R3042	22K	MET.SMD.WID 0805	1% 0.125W TK50	167/ 56
R3043	22K	MET.SMD.WID 0805	1% 0.125W TK50	179/ 56
R3044	470R	CHIP-WIDERST. TK200	5% 0.125W 0805	208/ 55
R3045	22R	CHIP-WIDERST. TK200	5% 0.1W 0603	296/ 55
R3046	22R	CHIP-WIDERST. TK200	5% 0.1W 0603	268/ 55
R3047	3K9	MET.SMD.WID 0805	1% 0.125W TK50	167/ 54
R3048	3K9	MET.SMD.WID 0805	1% 0.125W TK50	179/ 54
R3049	47K	CHIP-WIDERST. TK200	5% 0.125W 0805	119/ 53
R3050	470R	CHIP-WIDERST. TK200	5% 0.125W 0805	208/ 53
R3051	1K	CHIP-WIDERST. TK200	5% 0.1W 0603	297/ 53
R3052	10K	CHIP-WIDERST. TK200	5% 0.1W 0603	167/ 52
R3053	10K	CHIP-WIDERST. TK200	5% 0.1W 0603	180/ 52
R3054	47K	CHIP-WIDERST. TK200	5% 0.125W 0805	234/ 52
R3055	470R	CHIP-WIDERST. TK200	5% 0.1W 0603	225/ 51
R3056	3K9	MET.SMD.WID 0805	1% 0.125W TK50	172/ 50
R3057	3K9	MET.SMD.WID 0805	1% 0.125W TK50	175/ 50
R3058	100R	CHIP-WIDERST. TK200	5% 0.125W 0805	247/ 50
R3059	22R	CHIP-WIDERST. TK200	5% 0.1W 0603	377/ 50
R3060	10K	CHIP-WIDERST. TK200	5% 0.1W 0603	206/ 49
R3061	22R	CHIP-WIDERST. TK200	5% 0.1W 0603	268/ 48
R3062	47R	CHIP-WIDERST. TK200	5% 0.1W 0603	346/ 48
R3063	47R	CHIP-WIDERST. TK200	5% 0.1W 0603	348/ 48
R3064	22R	CHIP-WIDERST. TK200	5% 0.1W 0603	295/ 48
R3065	100R	CHIP-WIDERST. TK200	5% 0.125W 0805	246/ 47
R3066	10K	CHIP-WIDERST. TK200	5% 0.1W 0603	235/ 46
R3067	100R	CHIP-WIDERST. TK200	5% 0.125W 0805	246/ 45
R3068	270R	CHIP-WIDERST. TK200	5% 0.125W 0805	347/ 44
R3069	10K	CHIP-WIDERST. TK200	5% 0.1W 0603	235/ 44
R3070	22R	CHIP-WIDERST. TK200	5% 0.1W 0603	377/ 42

RESISTORs: (continued)

PART NO	VALUE	DESCRIPTION		POS X/Y
R3071	100R	CHIP-WIDERST. TK200	5% 0.125W 0805	247/ 42
R3072	10K	CHIP-WIDERST. TK200	5% 0.1W 0603	349/ 42
R3073	4R7	CHIP-WIDERST. TK200	5% 0.125W 0805	250/ 41
R3074	100R	CHIP-WIDERST. TK200	5% 0.125W 0805	258/ 41
R3075	22R	CHIP-WIDERST. TK200	5% 0.1W 0603	269/ 40
R3076	22R	CHIP-WIDERST. TK200	5% 0.1W 0603	294/ 40
R3077	4K7	CHIP-WIDERST. TK200	5% 0.1W 0603	269/ 39
R3078	22R	CHIP-WIDERST. TK200	5% 0.1W 0603	377/ 39
R3079	330K	CHIP-WIDERST. TK200	5% 0.125W 0805	131/ 37
R3080	22R	CHIP-WIDERST. TK200	5% 0.1W 0603	282/ 36
R3081	4K7	CHIP-WIDERST. TK200	5% 0.1W 0603	260/ 36
R3082	22R	CHIP-WIDERST. TK200	5% 0.1W 0603	377/ 35
R3083	10K	CHIP-WIDERST. TK200	5% 0.1W 0603	290/ 35
R3084	1K	CHIP-WIDERST. TK200	5% 0.1W 0603	287/ 35
R3085	10K	CHIP-WIDERST. TK200	5% 0.1W 0603	289/ 35
R3086	4K7	CHIP-WIDERST. TK200	5% 0.1W 0603	248/ 34
R3087	1K	CHIP-WIDERST. TK200	5% 0.1W 0603	283/ 34
R3088	10M	CHIP-WIDERST. TK200	5% 0.125W 0805	279/ 34
R3089	4K7	CHIP-WIDERST. TK200	5% 0.1W 0603	260/ 33
R3090	330K	CHIP-WIDERST. TK200	5% 0.125W 0805	276/ 33
R3091	4K7	CHIP-WIDERST. TK200	5% 0.1W 0603	260/ 31
R3092	22R	CHIP-WIDERST. TK200	5% 0.1W 0603	354/ 30
R3093	22R	CHIP-WIDERST. TK200	5% 0.1W 0603	364/ 30
R3094	22R	CHIP-WIDERST. TK200	5% 0.1W 0603	369/ 30
R3095	2R2	MET.SMD.WID. RC11	5% 0.25W 1206	180/ 30
R3096	470R	CHIP-WIDERST. TK200	5% 0.125W 0805	272/ 30
R3097	4K7	CHIP-WIDERST. TK200	5% 0.1W 0603	352/ 30
R3098	68R	CHIP-WIDERST. TK200	5% 0.125W 0805	321/ 29
R3099	10K	CHIP-WIDERST. TK200	5% 0.1W 0603	371/ 30
R3100	4K7	CHIP-WIDERST. TK200	5% 0.1W 0603	260/ 28
R3101	4K7	CHIP-WIDERST. TK200	5% 0.1W 0603	246/ 28
R3102	22R	CHIP-WIDERST. TK200	5% 0.1W 0603	177/ 27
R3103	1K	CHIP-WIDERST. TK200	5% 0.1W 0603	268/ 27
R3104	10K	CHIP-WIDERST. TK200	5% 0.1W 0603	366/ 27
R3105	10K	CHIP-WIDERST. TK200	5% 0.1W 0603	367/ 27
R3106	4K7	CHIP-WIDERST. TK200	5% 0.1W 0603	246/ 26
R3107	68R	CHIP-WIDERST. TK200	5% 0.125W 0805	311/ 26
R3108	22K	CHIP-WIDERST. TK200	5% 0.125W 0805	284/ 26
R3109	4K7	CHIP-WIDERST. TK200	5% 0.1W 0603	257/ 24
R3110	10M	CHIP-WIDERST. TK200	5% 0.125W 0805	111/ 24
R3111	2R2	MET.SMD.WID. RC11	5% 0.25W 1206	185/ 24
R3112	10K	CHIP-WIDERST. TK200	5% 0.1W 0603	255/ 24
R3113	22K	CHIP-WIDERST. TK200	5% 0.125W 0805	284/ 23
R3114	68R	CHIP-WIDERST. TK200	5% 0.125W 0805	312/ 23
R3115	15R	KOHLE-SCHICHTW. 0207	5% 0.25W TK200	209/ 23
R3116	1M	CHIP-WIDERST. TK200	5% 0.125W 0805	120/ 21
R3117	2K7	CHIP-WIDERST. TK200	5% 0.125W 0805	404/ 20
R3118	10K	CHIP-WIDERST. TK200	5% 0.1W 0603	228/ 18
R3119	47K	CHIP-WIDERST. TK200	5% 0.125W 0805	209/ 17
R3120	10K	CHIP-WIDERST. TK200	5% 0.1W 0603	288/ 17
R3121	22K	CHIP-WIDERST. TK200	5% 0.125W 0805	106/ 16
R3122	4K7	KOHLE-SCHICHTW. 0207	5% 0.25W TK200	82/ 15
R3123	10K	CHIP-WIDERST. TK200	5% 0.1W 0603	251/ 15
R3124	47K	CHIP-WIDERST. TK200	5% 0.125W 0805	209/ 15
R3125	4K7	CHIP-WIDERST. TK200	5% 0.1W 0603	246/ 14
R3126	47K	CHIP-WIDERST. TK200	5% 0.125W 0805	217/ 12

RESISTORs: (continued)

PART NO	VALUE	DESCRIPTION	POS X/Y
R3127	10K	CHIP-WIDERST. TK200 5% 0.1W 0603	116/ 10

INDUCTORs:

PART NO	PART VALUE	DESCRIPTION	PACKAGE	POS X/Y
I3001	Fer.07	742 792 07 / 0805 Ferrite 100 Ohm	smd_0805	265/ 59
I3002	Fer.151	742 792 151 / 1206 Ferrite 70 Ohm	smd_1206	95/ 51
I3003	Fer.12	742 792 12 / 1206 Ferrite 150 Ohm	smd_1206	199/ 50
I3004	Fer.151	742 792 151 / 1206 Ferrite 70 Ohm	smd_1206	81/ 44
I3005	Fer.12	742 792 12 / 1206 Ferrite 150 Ohm	smd_1206	214/ 44
I3006	Fer.07	742 792 07 / 0805 Ferrite 100 Ohm	smd_0805	266/ 43
I3007	Fer.P.3	742 750 3 6-Loch Ferriteperle	i_ferritper	220/ 38
I3008	Fer.151	742 792 151 / 1206 Ferrite 70 Ohm	smd_1206	81/ 35
I3009	Fer.12	742 792 12 / 1206 Ferrite 150 Ohm	smd_1206	175/ 32
I3010	Fer.12	742 792 12 / 1206 Ferrite 150 Ohm	smd_1206	164/ 29
I3011	Fer.12	742 792 12 / 1206 Ferrite 150 Ohm	smd_1206	362/ 26
I3012	4u7	FASTRON TYP SMCC SETRON 29617	i_smcc	218/ 25
I3013	Fer.07	742 792 07 / 0805 Ferrite 100 Ohm	smd_0805	323/ 25
I3014	4u7	FASTRON TYP SMCC SETRON 29617	i_smcc	227/ 24
I3015	4u7	FASTRON TYP SMCC SETRON 29617	i_smcc	292/ 23
I3016	Fer.12	742 792 12 / 1206 Ferrite 150 Ohm	smd_1206	213/ 23

XTAL's:

PART NO	PART VALUE	DESCRIPTION	PACKAGE	POS X/Y
X3001	32.768KHz	UHR-QUARZ 3x8	quarz_3x8	279/ 31
X3002	14MHZ31818	QUARZ HC49H4 SMD	hc49h4_smd	319/ 15

CONNECTORs:

PART NO	PART NAME	DESCRIPTION	FUNCTION	POS X/Y
CN3001		Anschl. Rasterstgl.	DOUT	342/ 72
CN3002	Steckverbindungssatz	4-pol, zum einlöten	PHONES	81/ 58
CN3003	LOETAUGE		+	103/ 54
CN3006	LOETAUGE		-	103/ 27
CN3007	KLINKE STEREO m. Schalt	d=6.3mm H=6.5mm		90/ 23
CN3010	Stiftw. 34p/180°		FRONT-BACK	131/ 69
CN3012	Stiftw. 14p/180	SETRON 13758	DISPLAY	134/ 36
CN3013	Stiftw. 10p/180	SETRON 13757	DEBUG	265/ 35

SWITCHs:

PART NO	PART NAME	DESCRIPTION	FUNCTION	POS X/Y
SW3001	Taster 6x6 H=5mm	SKHHAR,260GF,Alps	Inst1	11/ 69
SW3002	Taster 6x6 H=5mm	SKHHAR,260GF,Alps	Inst2	30/ 69
SW3003	Taster 6x6 H=5mm	SKHHAR,260GF,Alps	Inst3	49/ 69
SW3004	Taster 6x6 H=5mm	SKHHAR,260GF,Alps	Inst4	68/ 69
SW3005	Taster 6x6 H=5mm	SKHHAR,260GF,Alps	Global	153/ 68
SW3006	Taster 6x6 H=5mm	SKHHAR,260GF,Alps	Multi	153/ 54
SW3007	Taster 6x6 H=5mm	SKHHAR,260GF,Alps	Up	192/ 51
SW3008	Encod w. Detend	ALBS 401694	Play	109/ 41
SW3009	Taster 6x6 H=5mm	SKHHAR,260GF,Alps	Edit	153/ 41
SW3010	Taster 6x6 H=5mm	SKHHAR,260GF,Alps	Left	182/ 41
SW3011	Taster 6x6 H=5mm	SKHHAR,260GF,Alps	Right	202/ 41
SW3012	Taster 6x6 H=5mm	SKHHAR,260GF,Alps	Down	192/ 31
SW3013	Taster 6x6 H=5mm	SKHHAR,260GF,Alps	Sound	153/ 27

SWITCHs: (continued)

PART NO	PART NAME	DESCRIPTION	FUNCTION	POS X/Y
SW3014	Taster 6x6 H=5mm	SKHHAR,260GF,Alps	Play	125/ 24
SW3015	Taster 6x6 H=5mm	SKHHAR,260GF,Alps	Shift	153/ 14
SW3016	Encod w/o Detend	ALBS 401693	Value2	58/ 12
SW3017	Encod w/o Detend	ALBS 401693	Value1	21/ 12
SW3018	Taster 6x6 H=5mm	SKHHAR,260GF,Alps	On/Off	399/ 9
SW3019	Encod w/o Detend	ALBS 401693	Matrix1	267/ 8
SW3020	Encod w/o Detend	ALBS 401693	Matrix2	303/ 8
SW3021	Encod w/o Detend	ALBS 401693	Matrix3	339/ 8
SW3022	Encod w/o Detend	ALBS 401693	Matrix4	375/ 8
SW3023	Taster 6x6 H=5mm	SKHHAR,260GF,Alps	Peek	121/ 7
SW3024	Taster 6x6 H=5mm	SKHHAR,260GF,Alps	Multimde	99/ 7

MECHANICAL's:

PART NO	PART NAME	DESCRIPTION	FUNCTION	POS X/Y
M3005	Heatsink	FK237 SA-220V		121/ 59
M3006	Heatsink	SK129STIC TO220		222/ 31

MISCELLANEOUS:

PART NO	PART NAME	DESCRIPTION	POS X/Y
F3001		Solderprint Mark	21/ 73
F3002		Solderprint Mark	395/ 73
F3003		Feducialmark	398/ 71
F3004		Feducialmark	5/ 15
F3005		Solderprint Mark	21/ 7
F3006		Solderprint Mark	395/ 7
TP10	TDI	Test Point	356/ 61
TP11	TCK	Test Point	355/ 52
TP12	TDO	Test Point	357/ 52
TP13	DE	Test Point	362/ 36
TP14	TMS	Test Point	354/ 59
TP15	TRST	Test Point	357/ 59
TP34	HBCLK	Test Point	349/ 45
TP35	CLK	Test Point	365/ 36